



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

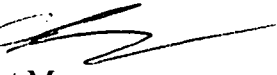
1200 Sixth Avenue
Seattle, Washington 98101

May 11, 2006


ACTION MEMORANDUM

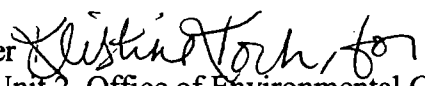
DATE:

SUBJECT: Action Memorandum for a Removal Action at the Port of Portland Terminal 4 site within the Portland Harbor Superfund Site, Portland, Multnomah County, Oregon

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Site ID: CERCLIS – OR987172509

I. PURPOSE

The purpose of this Action Memorandum is to document the U.S. Environmental Protection Agency's (EPA) approval of the removal action described herein for the Port of Portland Terminal 4 site located within the Portland Harbor Superfund Site, Portland, Multnomah County, Oregon (the "site"). A removal action will be completed at the Terminal 4 site and will be conducted by the Port of Portland (the Port) pursuant to an Administrative Order on Consent (CERCLA 10-2004-0009). On October 2, 2003, EPA signed the Administrative Order on Consent (AOC) agreed to by the Port of Portland (USEPA 2003). A Statement of Work (SOW) was attached to the AOC and incorporated into it. The AOC requires the Port to conduct an Engineering Evaluation and Cost Analysis (EE/CA) for a non-time critical removal

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action (NTCRA) at Terminal 4. Terminal 4 is within the boundaries of the initial study area for the Portland Harbor Superfund Site.

The Draft EE/CA was reviewed and approved by EPA. The EE/CA was finalized in May 2005 and initially put forth for a 30-day public comment period. Subsequent to the initial 30-day public comment period, the EPA granted an extension of 60 days for public review, ending on September 7, 2005.

By approval of this memorandum, EPA Region 10 determines that: 1) the conditions at the site may present an imminent and substantial endangerment to public health, or welfare, or the environment; and 2) the site conditions meet the criteria of the National Contingency Plan (NCP), 40 CFR Section 300.415, for a removal action. The removal action is required for immediate reduction of the risk to the public and the environment from uncontrolled hazardous substances at the Terminal 4 site. An administrative record has been prepared for this removal action. No obligation of funds is necessary as this action will be conducted by the Port of Portland under a CERCLA order.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

The EPA identification number for the Site is: CERCLIS – OR987172509. The Terminal 4 site is located at 11040 North Lombard in Portland, Oregon and is within the boundaries of the initial study area of the Portland Harbor Superfund Site. The Portland Harbor Superfund Site was listed on the National Priorities List (NPL), pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, on December 1, 2000. The Port of Portland was notified of its potential responsibility for response costs. The Port of Portland is one of ten parties that signed an administrative order on consent for Remedial Investigation/Feasibility Study (RI/FS) activities with EPA in September 2001.

The Port of Portland, a port district of the State of Oregon, owns the Terminal 4 uplands between River Miles 4.1 and 4.5 on the Lower Willamette River. The Port also owns a portion of the submersible and submerged lands in Slip 1 and Slip 3 located within the Removal Action Area (defined below). The remainder of the submersible or submerged land is owned by the State of Oregon and managed by the State of Oregon Department of State Lands (DSL). The location of the Terminal 4 site is shown on Figures 1 and 2.

The Removal Action Area is defined in the AOC as “that portion of the site adjacent to and within the Port of Portland’s Terminal 4 at 11040 North Lombard, Portland, Multnomah County, Oregon, extending west from the ordinary high water line on the northeast bank of the Lower Willamette River to the edge of the navigation channel, and extending south from the

downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay." The boundaries of the Removal Action Area are shown on Figure 3.

B. Site Background

Terminal 4 is currently used as an operating marine facility with a variety of tenants and tenant operations, including importation of automobiles, exportation of soda ash, import and export of dry and liquid bulk cargo, associated rail intermodal facilities, and associated petroleum storage facilities. Adjacent property owners include Schnitzer Steel, Northwest Pipe and Casing, and the Burgard Industrial Park. The location of the site is shown on Figures 1 and 2.

There is a long tenant history at Terminal 4. Past tenant operations primarily involved the movement of bulk commodities such as grains and mineral concentrates. Operations at Terminal 4 have also included the storage and use of petroleum products such as diesel fuel, bunker C oil, and gasoline, which were typically stored in underground storage tanks (USTs) and above ground storage tanks (ASTs) at the St. John Tank Farm and at various discrete business locations. Many of these tanks have since been removed. Pipelines to move bulk liquids and to fuel locomotives and other equipment have been in use at the site. A fumigation facility was also operated at Terminal 4. In addition, pencil pitch, a coal tar distillate, was handled at Terminal 4 from approximately 1978 to 1998. Historically, Slip 1 has been used for bulk and break-bulk cargo loading and unloading operations, and Slip 3 has been used for loading and unloading dry and liquid bulk cargo such as Bunker C, diesel, pencil pitch and metal ores.

Investigations conducted by the Port of Portland as part of the Engineering Evaluation/Cost Analysis activities indicated that based on their differences in chemical, physical, and operational characteristics, five subareas within the Removal Action Area have been identified, which include:

- Berth 401
- Slip 1
- Wheeler Bay
- Slip 3
- North of Berth 401

Each of these subareas has site-specific chemical conditions, physical characteristics, or operations and logistical concerns which require different approaches for site remediation. These conditions were considered during screening of remedial technologies and selection of the preferred alternative.

1. Removal Site Evaluation

Past operations and waste disposal practices at the Terminal 4 site are considered to be the primary sources of the most significant contaminants found at the site. These past releases from the Terminal 4 site are the primary source of contaminants in the river sediments that are subject to this removal action. The Port of Portland has conducted investigations in upland areas of the site to evaluate whether there is an ongoing source of contamination to the in-water area and investigations are also being conducted as part of the Portland Harbor Superfund Site to evaluate contaminants in river sediments other than those addressed in this removal action.

Hazardous substances found in the Removal Action Area to date include: polynuclear aromatic hydrocarbons (PAHs), metals (mercury, cadmium, chromium, lead and zinc), pesticides (DDT, DDD, DDE), phthalates and polychlorinated biphenyls (PCBs). Many of the contaminants detected in sediments at the site are known or suspected human carcinogens. In addition, pencil pitch (coal tar), a main source of contamination in sediments is a suspected carcinogen that can harm humans through skin contact, inhalation, or ingestion. The contaminated sediments represent a potential continuing source to the river which have the potential to impact human health and/or ecological receptors. The EPA has determined that the presence of the contaminated sediments constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

The EE/CA at Terminal 4 was initiated based on the presence of these organic chemicals and metals in sediments at concentrations that exceed risk-based sediment quality guidelines (SQGs), demonstrated toxicity of sediments to benthic macroinvertebrates, and presence of persistent, bioaccumulative, and toxic (PBT) compounds in sediments. SQGs used for the site include Threshold Effects Concentrations (TECs) and Probable Effects Concentrations (PECs) (MacDonald et al, 2000). The TEC is a low effects guideline that represents concentrations below which toxicity effects are unlikely to be observed in freshwater benthic invertebrates. The PEC is a probable effects guideline that represents concentrations above which toxicity effects are likely to be observed in freshwater benthic invertebrates. Chemicals in sediments exceeding SQGs include metals (copper, cadmium, lead, mercury, and zinc), PAHs, PCBs, DDT, DDD, and phthalates.

Persistent, bioaccumulative, and toxic (PBT) compounds including PCBs, DDD/DDE/DDT, and phthalates were also detected in some fish and crayfish samples collected from the Removal Action Area for the Harbor-wide RI/FS in addition to sediments. However, the relative risk from these compounds was not evaluated for the EE/CA because standard sediment quality guidelines are not available for assessing risks from bioaccumulation.

TEC exceedances are numerous and widespread throughout the Removal Action Area. PEC exceedances, representing the highest chemical concentrations, are significantly less but

have been identified in most of the subareas in one or more locations. PEC exceedance ratios (contaminant concentration divided by the PEC), summarized by sediment type, include:

Surface sediment: PAHs, DDT, and PCBs detected in Slip 1, with PEC exceedance ratios of less than 2. Lead and PAHs detected in Wheeler Bay with PEC exceedance ratios less than 2. Lead and zinc detected in Slip 3 with maximum PEC exceedance ratios of 5. PAHs detected in Slip 3 with a maximum PEC exceedance ratio of 26.

Under-Pier Sediment: Cadmium, lead, and zinc detected in Slip 1 and Slip 3 with PEC exceedance ratios between 1 and 15. PAHs detected in Slip 3 with a maximum PEC exceedance ratio of 18.

Subsurface Sediment: Lead, zinc, and DDD detected in Slip 1 with a maximum PEC exceedance ratio of 2. Lead, mercury, and PAHs detected in Wheeler Bay, with maximum PEC exceedance ratios of 24, 1 and 4, respectively. Mercury, PAHs, DDD, and PCBs detected in Slip 3 with maximum PEC exceedance ratios of 3.

The presence of these chemicals at concentrations in sediment exceeding probable effects guidelines supports the EPA-required removal action. See Section III for discussion of potential exposure and risk to site receptors.

In accordance with the AOC, the removal action focuses on in-water sediments extending west from the ordinary high water line to the edge of the navigation channel in the Willamette River and south from the downstream end of Berth 414 to the end of Berth 401. Other contaminated media, including surface water, groundwater, and soils, are being considered in other regulatory programs, which include the uplands investigation at Terminal 4 under oversight from the Oregon Department of Environmental Quality (DEQ) and the RI/FS for the Portland Harbor Superfund Site under the oversight of EPA.

2. Physical Location

The Port of Portland, a port district of the State of Oregon, owns the Terminal 4 uplands between River Miles 4.1 and 4.5 on the Lower Willamette River. The Port also owns a portion of the submersible and submerged lands in Slip 1 and Slip 3 located with the Removal Action Area. The remainder of the submersible or submerged land is owned and managed by the State of Oregon, by the Department of State Lands. The entire Terminal 4 site is approximately 150 acres in size and is currently used as an operating marine facility with a variety of tenants and tenant operations. Land use within the vicinity of the site is primarily heavy industrial, commercial, and recreational (river). Adjacent property owners include Schnitzer Steel, Northwest Pipe and Casing, and Burgard Industrial Park. The location of the site is shown on Figures 1 and 2.

All of the work will be completed in near-shore sediments. The Removal Action Area is defined as "that portion of the site adjacent to and within the Port of Portland's Terminal 4 at 11040 North Lombard, Portland, Multnomah County, Oregon, extending west from the ordinary high water line on the northeast bank of the lower Willamette River to the edge of the navigation channel, and extending south from the downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay." The Removal Action Area is shown on Figure 3.

3. Site Characteristics

Terminal 4 is currently used as an operating marine facility with a variety of tenants and tenant operations, including importation of automobiles, exportation of soda ash, import and export of dry and liquid bulk cargo, associated rail inter-modal facilities, and associated petroleum storage facilities. Past tenant operations at Terminal 4 involved the movement of bulk commodities such as grains and mineral concentrates. Operations at Terminal 4 have also included the storage and use of petroleum products such as diesel fuel, bunker C oil, and gasoline, which were typically stored in USTs and ASTs at the St. John Tank Farm and at various discrete business locations. Many of these tanks have since been removed. Pipelines to move bulk liquids and to fuel locomotives and other equipment have been located at the site. A fumigation facility was also operated at Terminal 4. In addition, pencil pitch, a coal tar distillate, was handled at Terminal 4 from 1978 to 1998.

Past operations and waste disposal practices at the Terminal 4 site are considered to be the primary sources of the most significant contaminants found at the site. These past releases from the Terminal 4 site are the primary source of contaminants in the river sediments that are subject to this removal action. See discussion above regarding contaminants detected, concentrations, sediment quality guidelines, and site conditions and Section III for exposure and associated risk.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

The portion of the Terminal 4 site that will be addressed by the removal action primarily consists of contaminated river sediments. The contaminants of concern are certain PAHs, metals, PCBs, pesticides (DDD/DDE/DDT), and phthalates. Many of the contaminants found at the site are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14) that may present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1). Concentrations and analysis of contaminants in the river sediments are described in the EE/CA (BBL, 2005) and in the Site Characterization Report (BBL, 2004). The primary sources of these contaminants are from upland commercial facilities and uses that released the substances into the river. Based on

current upland source control efforts, it is believed that significant upland sources have been controlled or will be by the time the removal action is completed.

The presence of hazardous substances at the site, or the past, present, or potential migration of hazardous substances currently located at or emanating from the site, constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22). See Section III for discussion of potential exposure and risk to site receptors.

5. NPL status

The Terminal 4 site is located within the boundaries of the initial study area of the Portland Harbor Superfund Site, which was listed on the NPL on December 1, 2000.

6. Maps, pictures, and other graphic representations

Relevant figures and tables are attached to this memorandum.

C. Other Actions

1. Previous actions

Limited previous sediment remediation or removal actions have been completed in the aquatic portions of the Terminal 4 site. Approximately 35,000 cubic yards of pencil-pitch contaminated sediments were removed from Slip 3 in December 1994 through January 1995 under a federal Clean Water Act Consent Decree. Confirmation sediment sampling indicated significant PAH and metal contamination remained. Slip 3 is the location of a number of documented and undocumented releases of pencil pitch (a suspected human carcinogen).

RI/FS activities have been completed for upland portions of the Terminal 4 site above the ordinary high water line under the Oregon DEQ's voluntary cleanup program (VCP). In 1993, an interim groundwater remediation system was activated along the eastern edge of Slip 3 to capture nonaqueous-phase liquid (NAPL) and contaminated groundwater from the upland area before it discharged to the river. Additional investigation and waste control/recovery activities have been completed since that time. Upland source control evaluations at Terminal 4 have indicated one area, east of Slip 3, where light nonaqueous-phase liquid (LNAPL) is present in the subsurface as a result of upland waste petroleum releases. In response to the presence of LNAPL, the Port completed a bank excavation and absorptive backfill remedial action in the area in 2004, which has mitigated the potential for LNAPL and dissolved-phase petroleum hydrocarbon seepage.

2. Current actions

The upland source control work is ongoing under state authorities and has included some recovery and disposal of subsurface contamination in some portions of the site. Potential sources of post-removal recontamination have been considered during the EE/CA evaluation of alternatives. These include: potential upstream sources (resuspension of sediments, stormwater discharges, industrial discharges and over-water activities), groundwater discharges, direct runoff and bank erosion, existing structures and operations, and material handling and spills. A combination of sampling, historical data evaluation, and modeling will be used for future evaluations of the removal action.

In addition, the CERCLA RI/FS for the Portland Harbor Superfund Site has included a number of sediment cores and surface samples collected near and within the Terminal 4 site boundaries. The RI/FS will evaluate the threats posed by other media on the site and post-removal sediment concentrations to determine whether additional cleanup is required for long-term protectiveness.

D. State and Local Authorities; Tribal Consultation

1. State and local actions to date

RI/FS and remedial actions have been conducted on the upland portions of the site under the oversight of the Oregon DEQ. The upland RI, risk assessment, and FS have been completed and a Record of Decision (ROD) was issued in April 2003. Remedial actions include removal of NAPL and contaminated groundwater through extraction wells, removal of contaminated soil at the Slip 3 riverbank, and continued monitoring. See the discussion above regarding in-water actions at the site.

The Oregon DEQ have participated in reviewing and commenting on documents associated with the Terminal 4 removal action and will continue to provide support to EPA as the project moves forward.

2. Potential for continued State/local response

The removal action at the Terminal 4 site will be conducted under CERCLA authority, with the state being given the opportunity to provide timely comments on project design documents and work plans. Coordination efforts with state and local authorities will continue throughout the project.

3. Tribal Consultation

EPA coordinated with six tribal governments on this action through the technical coordination team established for the Portland Harbor site. Additionally, EPA consulted with tribes that requested government to government consultation to solicit their input on the proposed cleanup alternative. EPA will continue to coordinate, allow opportunities for review and comment, and consult, as appropriate as the project proceeds.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A detailed risk assessment has not been conducted for the Terminal 4 site, however, a baseline risk assessment is being performed through the RI/FS for the Portland Harbor Superfund Site. A pathway analysis was conducted for this early action to expedite the removal of contaminated sediments through pathway elimination.

A. Threats to Public Health or Welfare

A detailed human health risk analysis is not necessary to allow selection of the preferred alternative, due primarily to the aggressive nature of the technologies proposed for the Removal Action, and the interim status of the Removal Action relative to the Harbor-wide ROD. The risk from direct exposure to sediments for humans will be assessed in the Portland Harbor RI/FS and any residual risk remaining from Terminal 4 will be evaluated using that assessment. However, a pathway analysis was completed to identify potential exposure pathways and potential contaminant sources, and to develop a geochemical conceptual model. These are shown on Figures 4 and 5.

Chemicals of potential concern for risk at the site include certain metals, PAHs, pesticides, phthalates, and PCBs. These chemical groups have been found to be present at elevated concentrations based on results of sediment sampling at Terminal 4. These chemicals are not the only analytes of potential concern at the site, but they are among the most important in terms of risk-based decision making and are good indicators of contaminant distribution at the site. Many of these compounds are known or suspected human carcinogens and known to bioaccumulate. In addition, pencil pitch, a main source of contamination in sediments, is a suspected carcinogen that can harm humans through skin contact, inhalation, or ingestion.

For human receptors, direct exposure results from activities that involve contact with sediments. Such activities include workers involved with operations or maintenance at Terminal 4, or fisherman that may contact sediments while retrieving traps or nets that have contacted contaminated sediment. In addition, potential exposure pathways for human health risks include ingestion of contaminated fish and dermal exposure to contaminated sediment at low tide. In particular areas, contaminated sediment is open and exposed in the Willamette River and on the

river bank, more so at low water levels. Trespassers on this and adjacent industrial property, transients camping nearby, recreational boaters, and workers all may be exposed by contact to site contaminants, especially during low water when more of the sediment is exposed.

Indirect exposure results from contact with contaminants that have been transferred from sediments to another exposure medium. Indirect exposure pathways may include ingestion of food that has become contaminated through contact with sediment contaminants. Humans that ingest fish or invertebrates taken from contaminated sediment areas may experience indirect exposure if contaminants have accumulated in tissues.

Persistent, bioaccumulative, and toxic (PBT) compounds including PCBs, DDD/DDE/DDT, and phthalates were detected in sediments, and were also detected in some fish and crayfish samples collected from the Removal Action Area for the Harbor-wide RI/FS.

Based on the concentrations detected in sediments at the site and the potential direct and indirect exposure pathways identified, EPA has determined that a removal action is required to mitigate impacts to public health, or welfare, or the environment.

B. Threats to the Environment

There is an imminent and substantial endangerment to the environment in part through the actual or potential exposure of the river water, river sediment, surface soils and standing surface water to hazardous substances and pollutants or contaminants. Actual or potential exposure to contaminated sediments exists for fish, shellfish, and other aquatic biota, such as benthic organisms, and wildlife, such as piscivorous birds. Actual or potential exposure to site contaminants by aquatic species, although not quantified, would be expected to become part of the ecological food chain as wildlife consume such species.

For aquatic invertebrates and fish, external contact with sediment, including porewater, can be a significant risk for metals and organic compounds. Direct exposure pathways include contact between receptors' external surfaces and contaminated bed sediment; ingestion of contaminated sediment by receptors, either incidentally during drinking or eating or as part of the feeding process (e.g., filter feeders); and contact between the receptor and re-suspended sediment (e.g., ventilation of gill surfaces).

The Site Characterization Report (BBL, 2004) identified organic chemicals and metals that were detected in surface sediments of the Removal Action Area. The Site Characterization Report also identified the chemicals for which concentrations exceeded generally accepted sediment quality guidelines, such as TECs and PECs (MacDonald et al, 2000). The TEC is a low effects guideline that represents concentrations below which toxicity effects are unlikely to be observed in freshwater benthic invertebrates. The PEC is a probable effects guideline that represents concentrations above which toxicity effects are likely to be observed in freshwater

benthic invertebrates. TEC exceedances are numerous and widespread throughout the Removal Action Area. PEC exceedances, representing the highest chemical concentrations, have been identified in most of the subareas in one or more locations, including metals (copper, cadmium, lead, mercury, and zinc), PAHs, PCBs, DDT/DDD, and phthalates.

Persistent, bioaccumulative, and toxic compounds including PCBs, DDD/DDE/DDT, and phthalates were detected in sediments, and were also detected in some fish and crayfish samples collected from the Removal Action Area for the Harbor-wide RI/FS. The relative risk from these compounds to aquatic species that are exposed to them was not evaluated for the EE/CA because standard sediment quality guidelines are not available for assessing risks from bioaccumulation.

Data that directly addresses ecological stress attributable to chemical contamination of sediments was gathered as part of sediment toxicity tests conducted for the Terminal 4 Slip 3 RI/FS. Sediments from 16 locations within and near Slip 3 were collected. Samples from the outer half of Slip 3 (riverward) did not fail any toxicity tests. However, six of nine samples from the inland half of Slip 3 were toxic to *Chironomus tentans* and/or *Hyallela azteca* in standard laboratory toxicity tests. Additionally, data from the Portland Harbor RI/FS show potentially elevated concentrations of some Terminal 4 analytes, including PCBs, DDT, DDD, and DDE in crayfish and sculpin gathered from Slip 1 and Slip 3.

Contact with contaminated sediment could pose a risk to waterfowl that may use, rest, or feed in the area. Other animals may also be exposed if using this water for drinking. Uptake to aquatic species is likely but not quantified. The Willamette River is a transitory area for a number of ESA-listed fish species, including five salmonid species listed as threatened under the Endangered Species Act. Coastal cutthroat trout, steelhead, and chum and chinook salmon are also all considered sensitive species by ODFW. Pacific lamprey and river lamprey are recognized as species of concern at the federal level by the U.S. Fish and Wildlife Service (USFWS). Western toad, Cope's giant salamander, tailed frog, northern red-legged frog, northwestern pond turtle, and painted turtle are all considered sensitive species by ODFW. In addition, northwestern pond turtle, tailed frog, and red-legged frog are listed as species of concern by USFWS. Aleutian Canada geese and the American peregrine falcon are protected as state endangered species (ODFW). Nine wetland plants that occur in the Willamette Valley and may occur in the Portland Harbor Superfund Site are all species of concern by USFWS.

Based on the concentrations detected in sediments at the site (above TEC/PEC criteria) and known or potential ecological pathways identified, EPA has determined that a removal action is required to mitigate potential impacts to the environment.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

This non-time-critical removal action at the Terminal 4 site will be implemented by the Port of Portland pursuant to an Administrative Order on Consent dated October 2, 2003. The removal action objectives (RAOs) established for the site are to: (1) reduce ecological and human health risks associated with sediment contamination within the Removal Action Area to acceptable levels, and (2) reduce likelihood of recontamination of sediments with the Removal Action Area.

These RAOs were further defined for evaluation of the alternatives to aid in understanding and achieving the RAOs. Reductions in human and ecological risks were further defined as reduction in contact for human health risks and attenuation of exposure pathways for ecological receptors. Reduction of the likelihood of recontamination within the Removal Action Area includes removal or capping of sediments as well as evaluation of potential ongoing sources.

As discussed in the EE/CA, all of the alternatives evaluated include monitored natural recovery, dredging, capping, and disposal components. The level to which these technologies would be employed was the basis for developing the different alternatives (see Section 2 below for description of other alternatives).

1. Proposed action description

The preferred alternative (Alternative C in the EE/CA) includes a combination of capping, monitored natural recovery (MNR), and dredging to achieve the objectives of the removal action. One or more of these technologies will be implemented in each of the subareas of the site dependent on nature and extent of contamination, associated risk and exposure, potential for transport, and engineering and operational considerations.

a. Preferred Alternative

The preferred alternative includes a dredge emphasis with confined disposal facility (CDF) disposal. The highest risk material (prevalent PEC exceedances) was selected for

dredging and incorporation into the CDF, and the lowest risk material was selected for MNR (generally at or below TECs). Capping will be used in areas with moderate levels of contaminants of concern where immobilization could limit risk to receptors or where it was deemed impractical to dredge, and port uses would not affect the integrity of a cap. See Figure 6 for configuration of the technologies in the various subareas of the Removal Action Area.

An at-grade CDF will be constructed in Slip 1 that would contain approximately 15.3 acres of contaminated sediments dredged from areas included in this remediation and potentially others in the Port or Harbor-wide cleanup actions. Dredging, capping, and MNR efforts will be implemented in affected areas to include Slip 1, Slip 3, Wheeler Bay, North of Berth 401 and Berth 401 itself.

Alternative C will meet the substantive requirements of the ARARs to the extent practicable and offers greater overall protection of human health and the environment than do the other alternatives, because:

- The most highly contaminated sediment will be contained in a CDF designed and constructed to be protective of human health and the environment.
- Handling and transport of the contaminated sediments are minimized and kept within the Terminal 4 site.
- The construction activities associated with implementation of the Preferred Alternative are essentially confined to the Terminal 4 site, with little impact to the local community.
- The short-term risk of recontamination during implementation is minimized because dredged sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the Willamette River.
- The long-term risk of recontamination of Terminal 4 is reduced because Slip 1 is eliminated.

b. Details of Preferred Alternative

(i). Details of the preferred alternative in each subarea.

Slip 1 – Full At-Grade Confined Disposal Facility

An at-grade CDF will be constructed in Slip 1 and sediment dredged in Slip 3 will be disposed of in the Slip 1 CDF. A total of approximately 115,000 cubic yards of contaminated sediment will be disposed in the CDF (105,000 cubic yards from Slip 3 and 10,000 cubic yards

from beneath the CDF containment berm to provide a structural foundation). The CDF has excess capacity available for other dredged sediment from the Portland Harbor Superfund Site, should the CDF be selected as an appropriate disposal site through a separate removal or remedial action decision and provided the material is compatible with Terminal 4-specific waste acceptance criteria. Waste acceptance criteria will be developed during design. By constructing the CDF to an at-grade surface, the newly gained land can be used for water dependent commercial purposes. An earthen containment berm will be constructed at the mouth of Slip 1 to serve as an isolation/retaining structure for the dredged sediment. The Port would acquire State of Oregon property for the purpose of constructing the CDF. The Department of State Land (DSL) has indicated a willingness to sell its portion of the land to the Port.

Slip 3 – Combination of Dredging, Capping, and Monitored Natural Recovery

The Removal Action in Slip 3 consists of a combination of dredging, capping, and a relatively small area of MNR (i.e., the under-pier area at Berth 410 below the finger pier portion). The area at Pier 5 will be capped, while the area between Pier 4 and Pier 5 will be dredged. Dredging will be performed in front of Pier 4 to remove contamination. Capping is impractical due to the need to maintain ship access to the actively used Berths 410 and 411. The nearshore slopes under Pier 4 at Berth 411 will be capped. Dredging under this pier is impractical due to the presence of riprap. Some dredging, but primarily capping, is used at a relatively small slope area at the head of Slip 3 below the existing pinch pile bulkhead. Dredging in this area would decrease the stability of the slope. Kinder Morgan's operations would be shut down during dredging of Slip 3, but for less time than the other alternatives. Dredged sediments from Slip 3 are disposed of in the Slip 1 CDF. Approximately 105,000 cubic yards of contaminated sediment will be dredged and disposed in the CDF.

Wheeler Bay – Monitored Natural Recovery and Capping

The depth of detected sediment contamination in Wheeler Bay is varied, extending from the surface to beyond 22 feet below the sediment surface. Since contaminant concentrations identified in most of Wheeler Bay are low, MNR is used for the majority of Wheeler Bay. A portion of the slope is capped as shown on Figure 6 because of higher PAH concentrations in one sample location.

North of Berth 414 – Monitored Natural Recovery

Similar to Wheeler Bay, low contaminant concentrations were found in the North of Berth 414 subarea up to 22 feet below the sediment surface. Therefore, MNR is used north of Berth 414.

Berth 401 – Monitored Natural Recovery and Capping

MNR is used for the majority of the Berth 401 area because of low contaminant concentrations. A relatively small area in the northeast corner of the Berth 401 area would be capped because of marginal PCB concentrations in one sample location.

(ii). Institutional Controls and/or Other EPA Considerations

The overall protectiveness of the alternative will be further enhanced by implementation of institutional controls for areas where contaminated sediment is contained in place with caps, where contamination resides at depth in MNR areas, and at the CDF. The primary removal action objective for the institutional controls for caps and the CDF will be to restrict and/or limit uses on or immediately adjacent to caps and the CDF to prevent accidental releases or unauthorized disturbances of contaminated sediment and ensure the long-term integrity of the containment. For MNR areas, the primary removal action objective for the institutional controls will be to restrict and/or limit uses of the MNR areas to prevent accidental releases or unauthorized disturbance of contaminated sediment that is at depth in those areas. Any future use or activities that may disturb contaminated sediment must be authorized and the sediment handled properly. For capping, proposed control mechanisms may include identification of the capped areas as no commercial vessel anchoring zones. These areas would be identified on U.S. Coast Guard navigational maps. In addition, the capped and MNR areas would be identified on Port maps/plans to ensure that the integrity is not impacted during future potential construction. Commercial activities by the Port and third parties may need to be limited above capped and MNR areas as well to ensure prop scour does not compromise the cap's integrity or disturb higher levels of contaminated sediment at depth in MNR areas. Proposed institutional controls for the CDF include the following: (1) notification to current tenants adjacent to the CDF of the CDF and any appropriate precautions they should take during its construction and/or completion; (2) specific lease language for future tenants who would occupy the land above the CDF notifying them of the CDF and restricting their construction activities based on the presence of the CDF; (3) including the CDF on Port plans/maps of the area with notation on limitations on use; (4) an easement, or if an easement is not possible, some other form of land use restriction that runs with the land that restricts activity below a specific elevation; and (5) registration of the CDF and associated appurtenances with the "call before you dig" utility location program. During design, further analysis of the most effective and implementable controls will be analyzed and implemented.

(iii). Issues Evaluated For Protectiveness. The Port, in consultation with EPA, considered the following issues in evaluating the protectiveness of the CDF over the long term:

- **Containment before, during and after an earthquake.** The evaluations support that the CDF can be designed and constructed to meet the structural strength and stability requirements for the Portland area. Because Portland is in a seismically active area, the impact of seismic events on structures needs special consideration. Preliminary analyses indicate that liquefaction occurs within the foundation soils below the berm and within the dredged fill, under seismic design events of operating level event (OLE) (72-year return) and contingency level event (CLE) (475-year return). For the OLE, the deformations should not immediately affect Port operations. More substantial liquefaction and resulting deformations of the berm are expected under the CLE. However, it is not expected that the berm deformation would lead to the release of contaminated sediment for either event. The CDF would have to be inspected following seismic events and any damage to the CDF berm or CDF cap would be repaired as soon as practicable.
- **Flood event impacts.** Concerns regarding the erosion potential of high velocity Willamette River flows and the potential impacts on the CDF stability and integrity were assessed. It was determined that while some sections of the channel may experience velocities faster and slower than the average, velocities above the average are typically located in the deeper parts of the mid-channel sections and not along the banks affecting the CDF. It was noted that propeller wash from tugboats and other boating activities have the potential to generate much higher velocities than flooding events, albeit for short durations. To address potential impacts to the CDF from flood events and boating velocities, the preliminary specifications of the CDF berm were designed to appropriate standards. The CDF berm will include placing clean sandy gravel fill with training terraces consisting of quarry spall rip-rap extending from the toe of the berm to the cap and along both the river and land sides of the berm. These are standard construction practices that have been successfully used along major river channels in the Northwest. The final berm design will consider the need for adequate toe protection for the alluvial materials on the channel bank and along the channel bottom, as well as over-excavation and installation of select fill and bank protection (rip rap) to protect the berm from undercutting by potential streambed scour and resulting toe scour. The final design will also consider long-term degradation (addressed through operations and maintenance); general scouring and potential for localized areas of scour (i.e., propeller wash); and estimates of the total depth of potential channel bed scour necessary to "key in" rip-rap to provide sufficient toe protection. Therefore, the erosion concerns regarding the slope face of the CDF berm will be addressed by covering the berm with erosion resistant rip-rap. During the design, the erosion potential will be evaluated and the rip-rap size selected according to standard design criteria. Potential short-term impacts of flooding and overtopping the berm during construction will be addressed by specifying construction techniques and by staging of the CDF berm construction. These details will be evaluated during final CDF design. The CDF would have to be inspected following significant flooding as soon as practicable.

- **Impacts from the CDF to the Willamette River's flood stage.** An assessment of potential impacts to the Willamette River demonstrated that no rise in the base flood elevations would result from the CDF and the action would comply with FEMA regulations. An assessment of the flood storage was also conducted. Although a portion of the CDF will be located above the non-storm winter stage and some flood storage will be lost from filling Slip 1, this volume of flood storage has an insignificant effect in reducing flood hazard. As a result, no noticeable increase in peak discharge is predicted and the loss of flood storage from the CDF would not have a noticeable impact downstream.
- **Long-term effects on the Willamette River from groundwater passing through the CDF and entering the river.** Preliminary fate and transport analyses show that water quality would meet the criteria for existing long-term water quality standards. As part of the design, EPA will require long-term monitoring to ensure that contaminants are not reaching the river in excess of pre-determined criteria. Acceptance criteria developed during the design process will ensure that only wastes with low leachability potential appropriate for a particular location within the CDF will be accepted.
- **Short-term effects to the Willamette River when sediment is being placed into the CDF.** The CDF may be filled with sediment delivered in slurry form if hydraulic or hydraulic cutterhead dredging is used, or it may be filled using barges and delivered to the CDF by hydraulic transport or double handling over the berm if mechanical dredging is used in Slip 3. Numerous re-suspension containment techniques, including controlled placement of the sediment and various containment structures (such as silt curtains and turbidity curtains), are available for minimizing water quality impacts to the extent practicable. Water quality monitoring criteria will be established for the CDF construction period to minimize water quality impacts to the maximum extent practicable.
- **Time required for sediments placed in the CDF to settle.** Because of the relatively high sand content of the Terminal 4 sediments to be placed in the CDF, consolidation will occur relatively quickly and is not expected to cause construction delays. Additional sediment or other material may be filled into the CDF over several construction seasons. It is expected that the settlement of these materials will develop during or shortly after placement. The design, construction, and scheduling of the final cap placement will take into account the consolidation of the fill and will include measures to ensure uniform settlement, representing little impact to the structural integrity of the cap over the sediment filled in the CDF.

- **Design components of the CDF.** As part of the CDF design process and follow on documents, the following will be outlined: Steps involved for post construction certification, final closure plan, temporary closure plan, and monitoring requirements.

(iv). **EPA Directed Modifications as a Result of Public Comment**

As a result of public comments received (see Section VIII Community Relations), EPA has identified additions and/or modifications to the Preferred Alternative which will be required to be implemented in the Removal Action design documents for EPA review and approval. These include:

CDF Sediment Disposal/Acceptance Criteria. Through the preliminary design process, significant care was taken to ensure that the methods of construction proposed would ensure effective containment of contaminants of concern in the CDF and below the cap. Models were tested to evaluate required cap thickness, dispersion of sediments, and integrity of the CDF during a variety of expected and extreme conditions. The design was modified in response to this evaluation. This program includes post-remediation monitoring of the CDF and capped areas to ensure that design criteria are maintained.

No sediment will be allowed into the facility which fails hazardous waste testing procedures (TCLP specifically). Materials that are generally leachable will not be accepted. Community review and comment will be solicited during the screening criteria development process for the CDF during design. No sediment will be accepted into the CDF other than the Terminal 4 materials without separate public review and comment on future proposed cleanup plans. The following sediment acceptance criteria will be used to determine suitability of any sediments proposed for placement in the saturated zone of the Terminal 4 CDF.

1. Only sediments from the Portland Harbor Superfund Site are eligible for placement in the saturated zone of the CDF.
2. No sediments that may be designated as characteristic hazardous waste or contain free-phase oil would be eligible for placement without treatment to control potential for release and migration of these substances.
3. Sediments must be of acceptable geotechnical character (to be defined during design) such that they do not impact the long-term performance of the CDF.
4. Sediments must undergo appropriate testing including bulk chemistry tests and pancake column leachate test (PCLTs) to document source characteristics acceptable for the CDF. Maximum chemical concentrations measured in representative PCLTs of the sediments must be protective (to be defined during design) of surface water quality criteria.

During the design of the CDF, the Port will be required to submit a detailed evaluation of the criteria for acceptance of sediment material into the CDF including methods for verification that sediment passes all criteria. The evaluation shall include proposed criteria (chemical and

physical), type and frequency of testing (i.e. analytical, leachability, etc.), detailed modeling results, and contingency factors. If sediment from another type of dredging project is proposed to be placed in the CDF, appropriate federal and state permits or approvals would be necessary.

CDF Geotechnical Considerations. The geotechnical seismic analysis shall be a component of design that establishes required construction materials, construction methods, and geometric aspects of the CDF containment berm to be appropriately protective of human health and the environment during an earthquake. Required design-level geotechnical seismic analysis for the Terminal 4 site and CDF containment berm stability are as follows:

1. Detailed characterization of seismic sources (known regional faults) in the vicinity of the Terminal 4 site for development of a site-specific seismic hazard analysis.
2. Development of input ground motions from seismic sources considering site-specific geotechnical considerations.
3. Evaluation of liquefaction potential for CDF containment berm, foundations soils, dredged material, and surrounding site soils potentially contributing to instability of the CDF during the design-level earthquake. This includes evaluation of liquefaction-induced deformations and lateral spreading.
4. Evaluation of slope stability and deformation, as appropriate, for critical cross-sections(s) including both pseudo-static and post-earthquake conditions.
5. Development of a contingency plan for post-earthquake inspection and repair.

MNR Contingency. MNR is proposed for certain portions of the Removal Action Area including along the Willamette River harbor line (Berth 401 and North of Berth 414) and Wheeler Bay. At these locations, MNR was determined to be highly probable within 5 years after removal action completion and during the projected timeframe for attenuation the removal would be protective. The areas selected for MNR exhibit generally low contaminant concentrations and the physical and chemical conditions are suitable for natural recovery processes to reduce the risk posed by surface contamination in sediment. EPA will require the Port to verify the progress and success of MNR through periodic monitoring consisting of sediment analysis to verify that sediment concentrations are decreasing over time. If after 5 years of post-removal action monitoring, concentrations are not consistent with RAOs for this removal or RAOs or remediation goals in a CERCLA ROD for the Portland Harbor Superfund Site, additional response actions will be evaluated and may be required by EPA, such as capping. The evaluation of MNR will be based, in part, on risk-based criteria and/or cleanup goals established by EPA through the harbor-wide RI/FS process for the Portland Harbor Superfund Site. MNR areas will also be subject to institutional controls, to be finalized during design, which will meet the objectives stated in the **"Institutional Controls and/or Other EPA Considerations"** Section above.

Mitigation. More specific mitigation goals and requirements are discussed in detail in the ARARs Section below.

2. Alternative Actions described in EE/CA

The EE/CA included the proposed action described above (identified as Alternative C in the EE/CA), and Alternatives A, B, and D. The No Action Alternative and Alternatives A, B, and D are described below.

- No Action Alternative: Provided for comparison purposes only, no activities would be implemented under this alternative and it does not meet the RAOs.
- Alternative A – MNR Emphasis: This alternative includes a small amount of dredging in Slip 3, but primarily MNR and capping.
- Alternative B – Cap Emphasis: This alternative includes a small amount of dredging in Slip 3, but primarily MNR and capping. This alternative is similar to Alternative A, but has a greater reliance on capping in some areas.
- Alternative D – Dredge Emphasis with Landfill Disposal – This alternative is similar to Alternative C, but involves landfill disposal of sediments instead of use of a CDF in Slip 1. This alternative differs from Alternatives A and B in that it involves dredging in Slip 1 and a greater amount of dredging in Slip 3.

Alternatives A, B, C, and D all have MNR, capping, and dredging as components of the Removal Action, but vary in the degree to which they apply the technologies deemed feasible for Terminal 4. For instance, the estimated volume of dredged sediment ranges from 105,000 cubic yards under Alternatives A and B, which emphasize MNR and capping, to 204,000 cy under Alternative D, which emphasizes dredging as a principal component. Only Alternative C includes onsite disposal of the dredged material in a CDF.

Through an evaluation of effectiveness, implementability, and costs, the proposed action (Alternative C) was selected as the preferred alternative. Alternatives A, B, C, and D are all found to be effective and implementable and all are considered to meet the RAOs. The estimated costs (total net present value) of the alternatives are \$23,303,000 for Alternative A, \$24,627,000 for Alternative B, \$30,555,000 for Alternative C, and \$26,431,000 for Alternative D. The CDF in Alternative C offers excess capacity that could be used for the disposal of contaminated sediments from other sites within the Portland Harbor Superfund Site, as well as for the placement of suitable sediments or fill. The Port valued the excess capacity at \$10,000,000. Incorporating the estimated value of the excess capacity of the CDF, the net estimated cost of Alternative C is approximately \$20,555,000.

3. Contribution to remedial performance

The Terminal 4 site is located within the initial study area of the Portland Harbor Superfund Site and is being investigated as part of the in-water Harbor-wide RI/FS. The Portland Harbor Superfund Site was listed on the NPL on December 1, 2000 and a Record of Decision is expected after the design of the Terminal 4 non-time-critical removal action. Due to the number of years remaining to select and implement a remedy Harbor-wide, this removal action is designed to immediately remove a large volume of contaminated sediments within the Terminal 4 site, reduce the risk of further migration of contaminants to adjacent sites, and reduce exposure to receptors to concentrations of chemicals that likely would require response action under any future remedial alternative.

Each of the Removal Action alternatives evaluated are expected to result in substantially cleaner sediments and reduce risk to the environment and human health. The Preferred Alternative is expected to provide an overall net benefit to the Portland Harbor Superfund Site by providing the opportunity to isolate and consolidate contaminated dredged materials on-site. In addition, a CDF with excess capacity may facilitate more expedited sediment cleanup in Portland Harbor by providing additional disposal options for future cleanup decisions. It is expected that establishing an in-water disposal site within the Portland Harbor Superfund Site would reduce the overall environmental impacts and potential public safety implications associated with transport of materials to offsite disposal facilities. Having one or more disposal options for the Portland Harbor Superfund Site also helps control the costs of disposal because it creates a more competitive market for disposal. This, in turn, makes dredging and removal of contaminated sediment a more cost effective remedy and encourages the consolidation of the contaminated sediments into a limited number of locations, which may reduce the area within the Willamette River where contaminated sediments would be contained in place.

This Action Memorandum only documents the EPA decision for the Terminal 4 Early Action. This decision is limited to MNR, capping, dredging, and disposal of sediments within the CDF which come from dredging within Terminal 4 to achieve the removal action objectives. Placement of additional material from any cleanup action in the excess capacity of the CDF will require additional EPA CERCLA decisions. Placement of dredged material as fill from another type of project will require appropriate federal and state permits or approvals. If future CERCLA decisions do not select the CDF as a disposal option, and/or if the Port does not secure federal or state approvals for filling Slip 1, the EE/CA and this Action Memorandum may require modification and amendment, respectively, to consider whether changes to the designed confinement facility in Slip 1 of the Terminal 4 dredged materials needs to be modified and/or the dredged materials removed to another disposal location.

4. Description of alternative technologies

Candidate technologies for sediment remediation were identified and screened prior to developing alternatives for further engineering analysis. General categories of remedial technologies considered at the screening stage included: capping, sediment excavation/removal, construction containment, and sediment transport, treatment, and disposal. Each of these candidate technologies were evaluated based on effectiveness, implementability, and cost. Technologies were eliminated from further consideration due to low expected technical feasibility or effectiveness. Technologies that were not cost-effective relative to other equally-protective options were also not retained.

5. Engineering Evaluation/Cost Analysis (EE/CA)

The Port of Portland prepared the EE/CA, which documents the development and evaluation of removal action alternatives, and discusses the rationale for the recommended alternative. The EE/CA was finalized in May 2005, and a copy of the Executive Summary of the EE/CA is provided in Attachment A. A 90-day public comment period on the EE/CA was held, and EPA prepared a response to public comments (Attachment B).

6. Applicable or relevant and appropriate requirements (ARARs)

For on-site activities, all state and federal ARARs will be complied with to the extent practicable. Preliminarily identified ARARs for the selected removal action are listed in Attachment C.

The Port prepared a Biological Assessment that evaluates the potential effects on threatened and endangered species from this removal action. The Biological Assessment is included in the EE/CA as Appendix P and consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service, was initiated.

A Clean Water Act 401 water quality certification will be issued for this project defining chemical and other monitoring requirements as well as limitations, best management practices, and reporting procedures for assuring compliance with state water quality standards. The point of compliance for monitoring parameters during dredging and construction likely will allow for a specific area where relevant standards may not be met. At this time it is our understanding that Oregon's water quality standards may not allow for mixing zones for dredging. EPA will coordinate with the State of Oregon on this issue. Any allowed mixing zone will protect beneficial uses of the river; however, it is not practicable to meet all water quality standards immediately adjacent to the dredge, or where cap material may be placed. Water quality impacts from the dredging, capping and construction of the CDF will be minimized to the maximum extent practicable.

As described in Appendix Q of the EE/CA (Draft CWA Section 404(b)(1) Analysis Memorandum), the Alternative C, including CDF disposal option, is an acceptable dredge and fill project consistent with the Clean Water Act for placement of fill in aquatic environments. The CDF would result in loss of aquatic habitat in Slip 1, but with adequate compensatory mitigation, no net loss of habitat quality and function will occur. Likewise, some temporal loss of habitat or function will result from dredging and capping areas which will require appropriate mitigation.

The CDF would result in loss of aquatic habitat in Slip 1, but with adequate compensatory mitigation, no net loss of habitat quality and function will occur. The preliminary evaluation indicates that construction of the CDF in Slip 1 would result in the loss of 15.3 acres of total aquatic area, including approximately 3.1 acres of shallow water (i.e., <20 feet deep), 11.5 acres of deepwater, 0.2 acres of vegetated shallows or wetlands, 3.5 acres of inundated piling areas, and 3,317 linear feet of shoreline which is comprised of various structures, unclassified fill, seawalls, and riprap. Temporal loss would occur when approximately 8.7 acres of cap are placed and 9.2 acres are dredged. Capped areas range from shallow water to deep water (though capped areas are primarily shallow water), while dredged areas are primarily in deeper water. A final approved mitigation plan is required prior to any loss of existing habitat. The assessment of habitat acreage and function lost and appropriate compensatory mitigation will be coordinated with the Tribes, as well as state and federal resource agencies, including through the ESA consultation process with NMFS. As part of the conceptual plan proposal for the mitigation project in the EE/CA, the overall objective for the mitigation project as well as specific, quantitative performance standards for both the construction and long term monitoring of the mitigation project will be established in development of the final, approved mitigation plan. However, some basic, general criteria are provided herein to address Lower Willamette River watershed issues:

- 1) All compensatory mitigation must be consistent to the maximum extent practicable with any established mitigation strategies or conservation initiatives supported by state and federal resource agencies for the Lower Willamette River basin
- 2) Preference will be given to compensatory mitigation plans that are consistent with habitat function.
- 3) All compensatory mitigation plans will include an assessment of how they contribute toward the conservation and recovery of ESA listed species.
- 4) Mitigation plans must include consideration for connectivity to existing habitat.
- 5) The potential success of the mitigation projects will be specifically factored into habitat plans.
- 6) All compensatory mitigation plans will include measurable performance objectives, management, monitoring and reporting requirements, responsibilities, and schedules.
- 7) Native species only will be utilized in any plantings to the maximum extent practicable.
- 8) Mitigation plans should include facility design and site plans for any development/redevelopment that occurs as a result of a fill. The facility and site plans must

ensure that the facility and site characteristics and functions do not create adverse impacts to water, sediment, and habitat quality during construction and operation.

9) Performance criteria will be developed that quantitatively relate to the above criteria. Potential performance criteria that will be used or considered include, but are not limited to: specific depth and acre size at specific depths (to be monitored over time), utilization surveys to verify the project objective is being met (e.g. diver surveys for juvenile salmonid use of the area), photopoint monitoring over time to ensure that percent coverage standards for flora, and maximum coverage ceilings for invasive species.

Compensatory mitigation plans will be developed pursuant to these performance criteria and in consultation with EPA and resource agencies, and be submitted to and approved by EPA during the Removal Action Design. EPA may consider mitigation proposals that do not meet all of the performance criteria if the Port demonstrates that the proposal otherwise contributes to conservation and recovery of ESA listed species and/or other relevant conservation initiatives for the Lower Willamette River basin.

Off-site activities will comply with all applicable local, state, and federal laws, including the Off-Site Disposal Rule (40 CFR 300.440).

7. Project schedule

The Terminal 4 Removal Action is an early action within the Portland Harbor Superfund Site. The construction sequencing for the Terminal 4 Removal Action was designed to be phased in order to maximize effectiveness and minimize other impacts. The anticipated schedule is dependent on the means of sediment transportation, which will be established in the design documents. The preliminary schedule is as follows:

For Barge transport:

- Year 1: Stage 1 berm construction and simultaneous capping in Wheeler Bay and at Berth 401. Miscellaneous other work such as demolition of piers and warehouses.
- Year 2: Dredging in Slip 3. Possibly placement of intermediate CDF cap.
- Year 3: Stage 2 berm construction and capping in Slip 3.

For pipeline transport:

- Year 1: Stage 1 berm construction and simultaneous capping in Wheeler Bay and at Berth 401. Miscellaneous other work such as demolition of piers.
- Year 2: Stage 2 berm construction, dredging in Slip 3 following completion of berm, and possibly placement of intermediate CDF cap.

- Year 3: Capping in Slip 3.
- Filling of the CDF will continue after construction year 3.

The estimated time to complete sediment remediation is 3 years. A monitoring program will be required which will include post-removal monitoring for monitored natural attenuation on an annual basis for the first five years. If after five years of post-removal action monitoring, concentrations are not consistent with the remedial action objectives, additional removal actions will be evaluated. Monitoring for capping and the CDF is proposed for years 1, 2, 5, 7, 10, 15, 20, 25 and 30.

B. Estimated Costs

The removal action is being implemented by the Port of Portland. The projected costs to implement this non-time-critical removal action are estimated at \$30.6 million (see Appendix O of the EE/CA). However, due to projected value of the excess capacity of the CDF (\$10 million), the net cost to implement the action is \$20.6 million. Estimated costs for the other alternatives ranged from \$23.3 million to \$26.4 million.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the action is delayed or not taken, contamination will continue to adversely affect the environment at levels exceeding probable effect concentrations. Delayed action will increase environmental risks through prolonged exposure to contaminants present in the sediments.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues at this site.

VIII. COMMUNITY RELATIONS

In July 2004, the Port initiated public outreach regarding the development of the Removal Action alternatives. Mechanisms used to solicit effective involvement of community members included project open houses, meetings with neighborhood associations, environmental groups, and community groups, project representation at community events, a project website for sharing information and deliverables with interested parties and project meetings at which community associations, government elected officials and staff, port stakeholders, government agencies, tribes, and rail roads are invited. On several occasions, EPA joined the Port of Portland project team when they made presentations at more than 20 neighborhood association and community group meetings. The Port also hosted a workshop and site tour in 2004 and hosted an open house at the Linnton Community Center during the comment period. In all, the Port has participated in and/or hosted 21 meetings and events attended by more than 275 people. An

effort has been made to meet with the groups more than once to provide updated project information.

The Administrative Record was prepared for the EE/CA and for this Action Memorandum. The Administrative Record is available at EPA, the Portland Central Library, St. Johns Branch Library, and the Northwest Branch Library.

The EE/CA for the Terminal 4 removal action was available for public review and comment from June 6, 2005 to September 7, 2005. Notice of a 30-day comment period was published in The Oregonian on June 6, 2005, and two notices of extension were published on June 20 and July 29, 2005. In addition, a postcard providing notice of the comment period start, followed by a May 2005 Fact Sheet summarizing the proposed EE/CA alternatives were mailed to over 900 addressees on the Portland Harbor project mailing list. The Administrative Record is available at EPA, the Portland Central Library, St. Johns Branch Library, and the Northwest Branch Library.

A public meeting was held on June 23, 2005 at the St. Johns Community Center to provide project information and accept spoken comments for the project record. EPA received 89 comment letters or spoken comments during the public comment period. EPA responded to all comment letters (see "Responsiveness Summary", dated March 7, 2006, in Attachment B).

In addition to the formal public comment opportunity, EPA provided routine monthly updates to the Portland Harbor Community Advisory Group (CAG) between May 2004 and July 2005. In addition, EPA met with the CAG Evaluation Committee to discuss the Terminal 4 EE/CA in July and December 2004.

IX. ENFORCEMENT

This removal action will be implemented by the Port of Portland, pursuant to an Administrative Order on Consent (CERCLA No. 10-2004-0009). The order describes the environmental work to be performed for the removal action. The work to be performed by the Port of Portland includes preparation and submittal of project design and removal action documents, implementation of the removal action, submittal of a Removal Action Completion Report, and submittal of a Long-Term Monitoring and Reporting Plan to ensure that the removal action objectives are achieved at the site.

X. RECOMMENDATION

This decision document represents the selected removal action for the Port of Portland Terminal 4 site, located within the boundaries of the Portland Harbor Superfund Site, Portland, Oregon, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the site.

Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action. None of the removal project costs come from the Regional Removal allowance. Your approval or disapproval should be indicated below.

Approve: 

Date: 5/11/06

Disapprove: _____

Date: _____

List of Figures, Tables, and Attachments

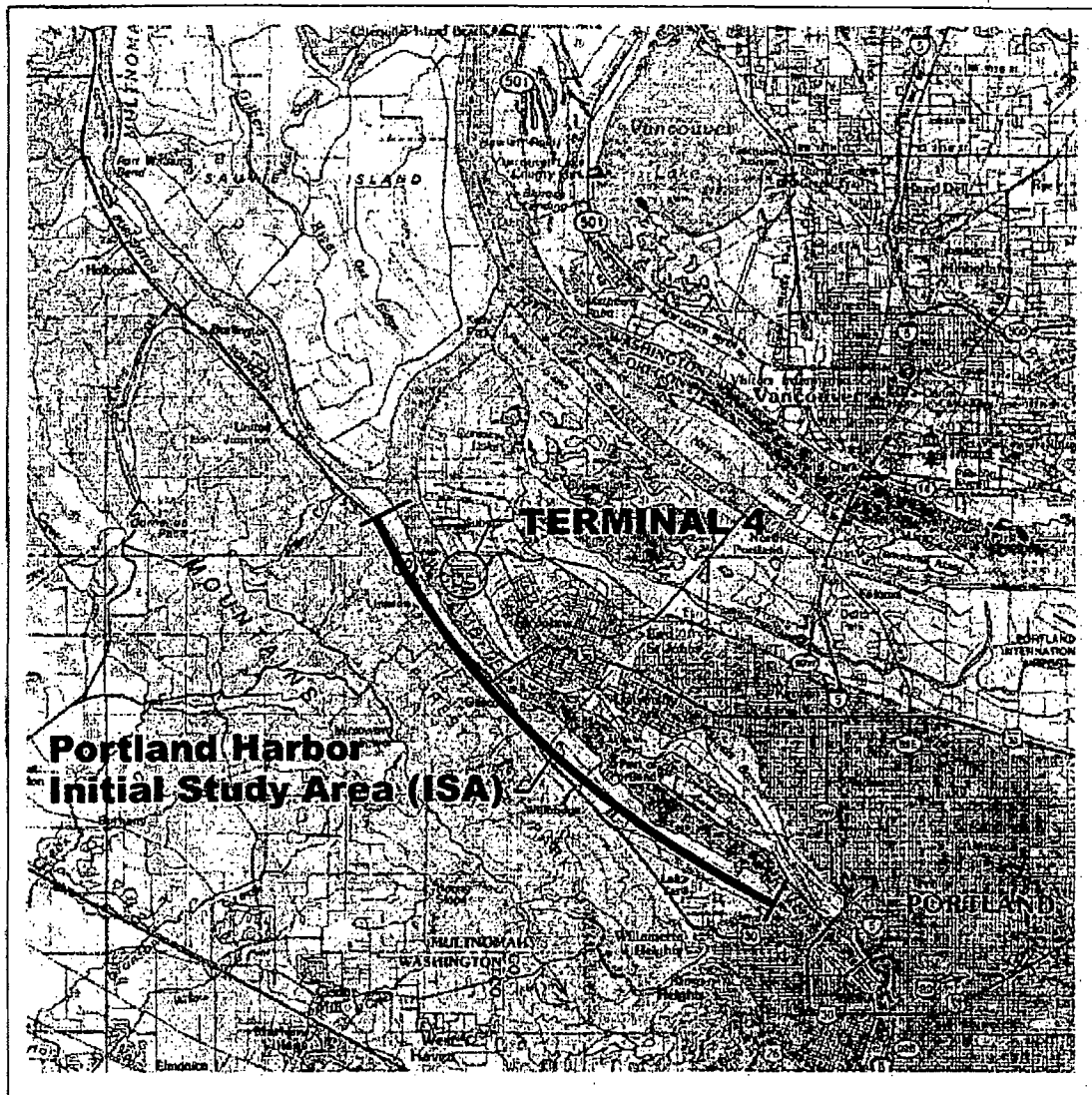
Figures

- | | |
|----------|--|
| Figure 1 | Vicinity Map (Figure 1-1 from the EE/CA) |
| Figure 2 | Terminal 4 Aerial Photograph (Figure 1-2 from the EE/CA) |
| Figure 3 | Removal Action Area Plan (Figure 7-1 from the EE/CA) |
| Figure 4 | Potential Exposure Pathways |
| Figure 5 | Geochemical Conceptual Model |
| Figure 6 | Selected Alternative, Dredge Emphasis with CDF Disposal (Section 7.3.4 from the EE/CA) |

Attachments

- | | |
|--------------|---|
| Attachment A | Executive Summary for the Engineering Evaluation/Cost Analysis, Terminal 4 Early Action |
| Attachment B | Responsiveness Summary for Public Comments on the Engineering Evaluation/Cost Analysis, Terminal 4 Removal Action |
| Attachment C | ARARs |

**EPA ACTION MEMORANDUM
TERMINAL 4
FIGURES**



0 2 4
Scale in Miles



DRAFT DOCUMENT

Do Not Quote or Cite:
This document is currently under review by US
EPA and its federal, state and tribal partners, and
is subject to change in whole or in part.

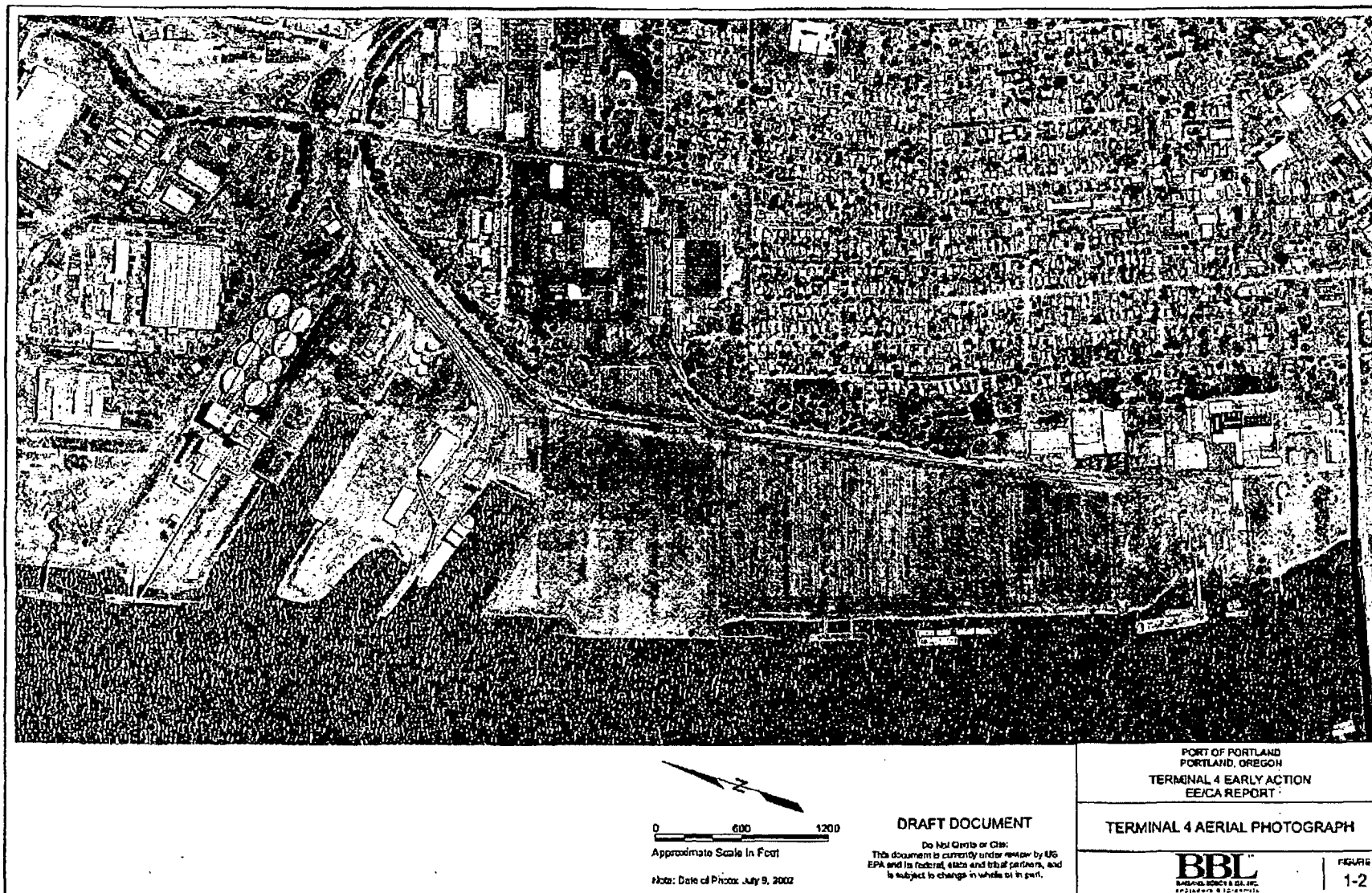
PORT OF PORTLAND
PORTLAND, OREGON
TERMINAL 4 EARLY ACTION
EE/CA REPORT

VICINITY MAP

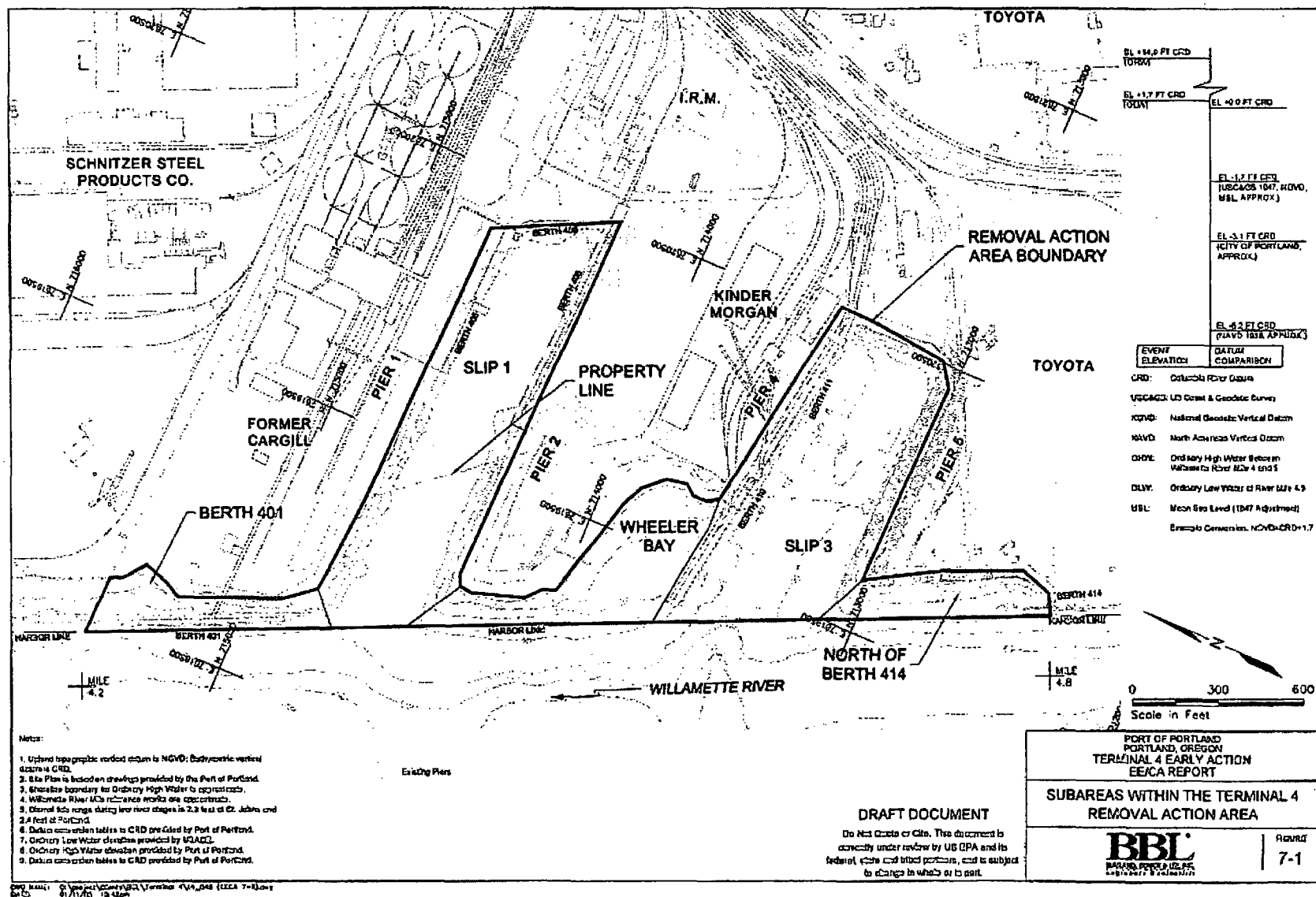
BBL
DAUGHERD, BUCK & LEE, INC.
ENGINEERS & SCIENTISTS

FIGURE
1-1

EPA ACTION MEMO FIGURE 1

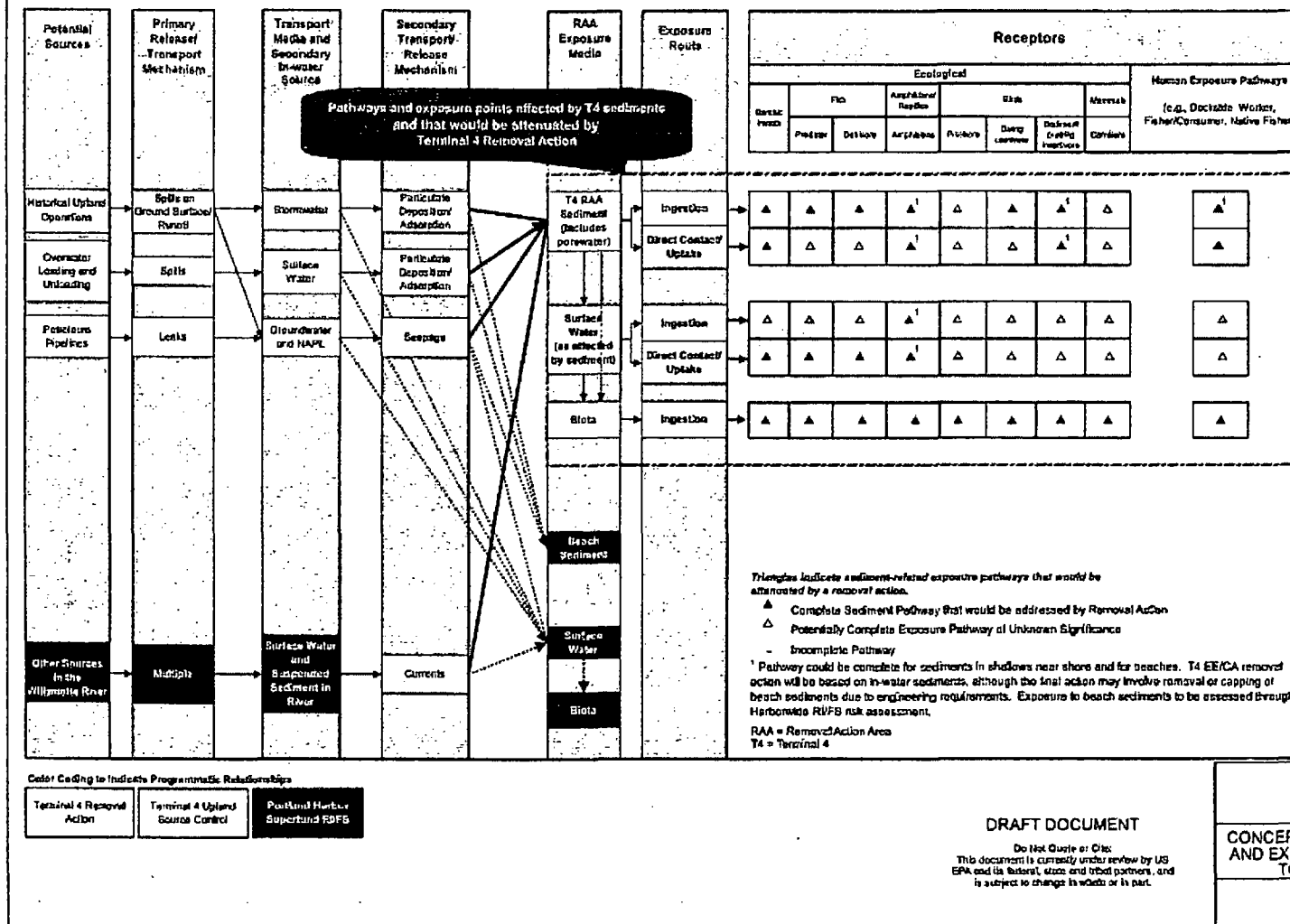


EPA ACTION MEMO FIGURE 2



EPA ACTION MEMO FIGURE 3

NOTE: This diagram is intended to show (1) the potential pathways by which generalized receptors may be exposed to contaminants through sediment-associated pathways, and (2) those pathways that would be attenuated, in whole or in part, by sediment removal actions at T4. Due to the streamlined nature of the EE/CA process, not all pathways will be the subject of extensive risk analysis in the EE/CA.

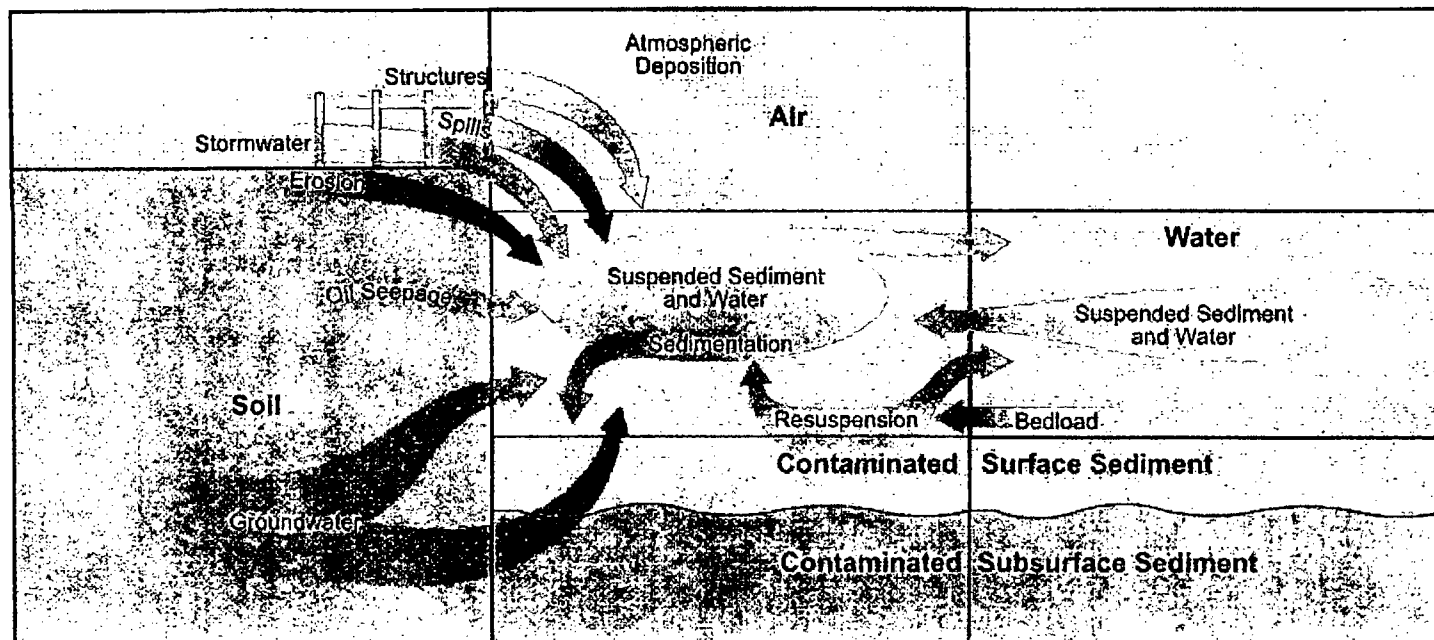


EPA ACTION MEMO FIGURE 4

Terminal 4 Upland

Removal Action Area

Willamette River



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PORT OF PORTLAND
PORTLAND, OREGON
TERMINAL 4 EARLY ACTION
EE/CA REPORT

GEOCHEMICAL CONCEPTUAL MODEL

BBL
BLASLAND BODEN & LEE INC.
engineers & scientists

FIGURE
3-2

7.3.4 Alternative C: Dredge Emphasis with CDF Disposal - At-Grade Full-Size CDF

Alternative C consists of construction of an at-grade CDF that occupies the entire Slip 1; a combination of dredging, capping, and MNR in Slip 3; a combination of MNR and capping in Wheeler Bay and Berth 401; and MNR in the North of Berth 414 subarea. Operationally, Pier 4 in Slip 3 and Berth 401 remain active. The grain facility barge leg and the International Raw Materials barge operations in Slip 1 are relocated, as demolition of warehouses and piers is assumed, including pulling/breaking timber piles and providing upland disposal of timber piling and construction debris. Outfalls are completely relocated and rerouted. Fortson storm sewer piping discharge to Slip 1 is abandoned under this alternative. Institutional controls for capped areas would include anchoring restrictions for commercial vessels and updating Port engineering maps/plans identifying the capped areas for any planned construction projects or changes in operations to ensure the integrity of the cap is not disturbed or compromised. Institutional controls for the CDF would include updating engineering baseline maps/plans to include the CDF boundaries, update provisions in tenant leases, as applicable, formalizing notification procedures for construction or change in operations in the area of the CDF. Deed notifications or easements may also be considered.

Detailed Description:

Slip 1 - Full At-Grade Confined Disposal Facility (CDF)

Sediment dredged in Slip 3 is disposed of in the Slip 1 CDF. An at-grade CDF that occupies the entire Slip 1 has excess capacity available for other dredged sediment. By constructing the CDF to an at-grade surface, the newly gained land can be used for water-dependent purposes consistent with existing zoning and Port use. An earthen containment berm is constructed at the mouth of Slip 1 to serve as an isolation/reinforcing structure for the dredged sediments. The area under the containment berm is dredged. The berm is placed on State-owned property. Use of State property requires negotiation.

Slip 3 - Combination of Dredging, Capping, and Monitored Natural Recovery

The Removal Action in Slip 3 consists of a combination of dredging, capping, and a relatively small area of MNR (i.e., the under-pier area at Berth 410 below the finger pier portion). The area in Pier 5 is capped, while the area between Pier 4 and Pier 5 is dredged. Dredging is performed in front of Pier 4 to remove contamination. Capping is impractical due to the need to maintain ship access to the actively used Berths 410 and 411. The nearshore slopes under Pier 4 at Berth 411 are capped. Dredging under this pier is impractical due to the presence of riprap. Some dredging, but primarily capping, is used at a relatively small slope area at the head of Slip 3 below the existing pinch pile bulkhead. Dredging in this area would decrease the stability of the slope.

Wheeler Bay - Monitored Natural Recovery and Capping

The depth of detected sediment contamination in Wheeler Bay varied, extending from the surface to beyond 23 feet below the sediment surface. Since contaminant concentrations identified in most of Wheeler Bay are low, MNR is used for the majority of Wheeler Bay. A portion of the slope is capped as shown on the figure because of higher PAH concentrations in one sample location.

North of Berth 414 - Monitored Natural Recovery

Similar to Wheeler Bay, low contaminant concentrations were found in the North of Berth 414 subarea up to 23 feet below the sediment surface. Therefore, MNR is used north of Berth 414.

Berth 401 - Monitored Natural Recovery and Capping

MNR is used for the majority of the area at Berth 401 because of low contaminant concentrations. A relatively small area in the northeast corner of the Berth 401 area would be capped because of marginal PCB concentrations in one sample location.

Construction Sequence, Comments, and Assumptions:

- It is assumed that approximately 10,000 cy of sediments would be dredged in Slip 1, in the area of the footprint of the CDF containment berm, to remove contaminated sediments and to provide a firm foundation for the berm.
- The sediments dredged in Slip 1 would be placed near the head of the slip. Placement should be performed with care to minimize sediment resuspension.
- The CDF containment berm would be constructed prior to dredging in Slip 3. The berm may be constructed in stages to allow barge access for disposal of Slip 1 sediments. If sediments are transported by the CDF in pipelines, it is assumed that the entire berm would be constructed prior to dredging. The berm material volume is fairly large and berm construction may take longer than one construction season.
- Dredging in Slip 3 should be performed prior to capping in that area to avoid reconsolidation of slope areas.
- Kinder Morgan's operations would be disrupted during the duration of dredging in Slip 3.
- An intermediate CDF cap may be required at the conclusion of Slip 3 dredging unless the period between disposal events is relatively short.
- Capping under the pier at Berth 411 may be performed during the year after dredging to minimize disruption of Kinder Morgan's operations.
- Simultaneous berm construction and capping in Wheeler Bay and at Berth 401 should be possible.

Assumed Schedule:

Per barge transport:

- Year 1: Stage 1 berm construction and simultaneous capping in Wheeler Bay and at Berth 401. Miscellaneous other work such as demolition of piers and warehouses.
- Year 2: Dredging in Slip 3. Possibly placement of intermediate CDF cap.
- Year 3: Stage 2 berm construction and capping in Slip 3.

Per pipeline transport:

- Year 1: Stage 1 berm construction and simultaneous capping in Wheeler Bay and at Berth 401. Miscellaneous other work such as demolition of piers.
- Year 2: Stage 2 berm construction, dredging in Slip 3 following completion of berm, and possibly placement of intermediate CDF cap.
- Year 3: Capping in Slip 3.

Filling of the CDF will commence after construction year 3.

Cost

Net Present Value (2005) = \$30,555,000 (\$20,555,000 including value of excess capacity)

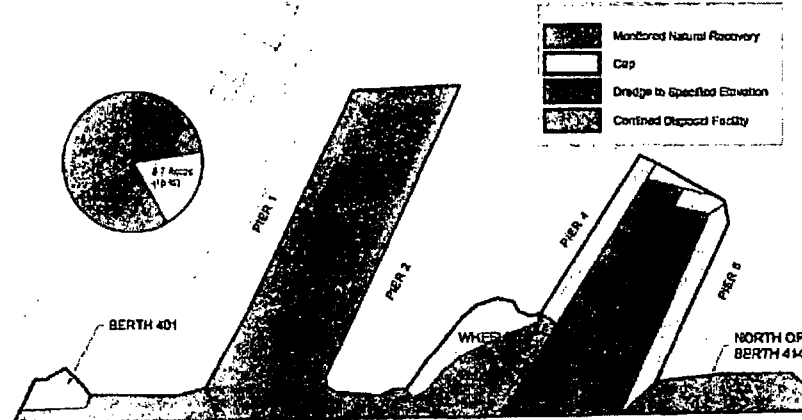
| IMPORTANT QUANTITIES | | | | | | | |
|---|-------|----------|---------|-------------|--------------------|-----------|---------|
| Item | Units | Quantity | | | | | |
| | | Slip 1 | Slip 3 | Wheeler Bay | North of Berth 414 | Berth 401 | Total |
| Dredging Area | Acres | 1.0 | 9.3 | | | | 10.2 |
| Dredging Volume | CY | 10,000 | 105,000 | | | | 115,000 |
| Interim Cap (if needed) | CY | | | | | | 20,000 |
| Under-Pier Capping Area | Acres | | 1.7 | | | | 1.7 |
| Non-Under-Pier Capping Area | Acres | | 2.8 | 3.0 | | 1.2 | 7.0 |
| Total Capping Area | Acres | | 4.5 | 3.0 | | 1.2 | 8.7 |
| Capping Volume | CY | | 22,000 | 14,500 | | 5,500 | 42,000 |
| MNR Area | Acres | 0.9 | 0.7 | 4.0 | 3.0 | 2.3 | 10.9 |
| Total Capacity of the CDF | CY | | | | | | 940,000 |
| CDF Excess Capacity - Saturated (dredged sediments) | CY | | | | | | 560,000 |
| Unstated Zone Capacity (Fill) | CY | | | | | | 245,000 |
| Volume of CDF Engineering Cap | CY | | | | | | 255,000 |
| CDF Berm Volume | CY | | | | | | 138,500 |

Notes:

cubic yard (CY)

For this calculation, a 10-foot-thick CDF cap was assumed. The top of CDF cap/berm was assumed to be at approx. elevation 31.5 ft, Columbia River Datum (CRD).

Dredge volumes do not include sediment bulking or consolidation.



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ATTACHMENT A

Executive Summary for the Engineering Evaluation/Cost Analysis Terminal 4 Early Action

TERMINAL 4 EARLY ACTION

*EE/CA Report
Public Review Draft*



PORT OF PORTLAND

Port of Portland
Portland, Oregon

May 31, 2005

BBL
BLASLAND, BUCKLEY & LEE, INC.
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Executive Summary

Background

In 2000, the U.S. Environmental Protection Agency (USEPA) added the Portland Harbor Superfund Site to the National Priorities List. In fall 2001, the USEPA and ten of the Superfund Site's potentially responsible parties entered into an Administrative Order on Consent for a Remedial Investigation/Feasibility Study of the Superfund Site. The Administrative Order on Consent allows Early Actions to be conducted to address known contamination at specific locations within the Superfund Site. Contaminants found in Terminal 4 sediment samples during a remedial investigation directed by the Oregon Department of Environmental Quality (DEQ) led to a determination that a Removal Action at Terminal 4 is warranted. Accordingly, the Port of Portland (Port) is conducting a Non-Time-Critical Removal Action (NTCRA) under an Administrative Order on Consent for Removal Action (the AOC) executed by the Port and USEPA in October 2003.

The AOC requires the Port to conduct an engineering evaluation and cost analysis (EE/CA) for the Terminal 4 Removal Action in which various Removal Action alternatives are identified, compared, and ranked for their relative performance at meeting specific objectives associated with the evaluation criteria of effectiveness, implementability, and cost. An evaluation of the existing data identified a number of data gaps associated with the characteristics of the Removal Action Area and with the impact of those characteristics on the identification and evaluation of Removal Action alternatives. A field characterization effort was therefore designed to gather specific information regarding the physical, engineering, hydrogeologic, sediment quality, dredged sediment quality, and hydraulics and sedimentation characteristics of the Removal Action Area. This field effort was performed during May through September 2004. Following completion of the field and laboratory activities associated with the characterization effort, a characterization report (BBL, 2004b) was prepared and submitted to the USEPA.

Based on the available characterization data, including the newly collected data presented in the characterization report (BBL, 2004b), the Port evaluated potentially applicable technologies that would be considered for inclusion in the development of Removal Action alternatives. In accordance with the AOC, the feasible and implementable technologies and a suite of Removal Action alternatives that incorporate the screened technologies as components were presented to the USEPA, the DEQ, the Tribes, and the Trustees in a technical briefing on October 29, 2004. This EE/CA report summarizes the screening results. The Removal Action alternatives are then evaluated both individually and comparatively for their effectiveness, implementability, cost, and ability to achieve the stated Removal Action Objectives (RAOs) for the Terminal 4 Early Action. Following that analysis, a Preferred Alternative is identified.

Removal Action Area Characteristics

The Removal Action Area characteristics, which are relevant to the selection of technologies and alternatives appropriate to Terminal 4, and the methodologies by which the characteristics were determined are described in detail in the characterization report for the Terminal 4 Early Action (BBL, 2004b). Section 2 of this document provides brief summaries of the Removal Action Area characteristics. Appendices A and C through G of this

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EE/CA report provide expanded summaries of Removal Action Area characteristics; an executive summary of Removal Action Area characteristics can be accessed in the characterization report (BBL, 2004b) as well.

Conceptual Model

A number of physical and chemical processes influence surface sediment contaminant concentrations within the Removal Action Area. Historical and potential ongoing sources – such as stormwater runoff, groundwater discharges, direct runoff and bank erosion, Removal Action Area sediment, operations, material handling, spills, and upstream contaminant sources to the Willamette River outside the Removal Action Area – may contribute contaminants to Terminal 4 sediment and surface water. Contaminant fate and transport within the surface sediment layer is controlled by several physical, biological, and chemical processes that together influence current and future surface sediment contaminant concentrations.

Section 3 presents the conceptual model of the Removal Action Area and summarizes the exposures and risks that may result from direct or indirect contact with sediment contaminants. The conceptual model of the Removal Action Area includes exposure pathways for human and ecological receptors to sediment contaminants, and the physical and chemical processes that control sediment contaminant concentrations. Section 3 also identifies specific chemicals of potential concern (COPCs) for specific receptor groups, such as benthic macroinvertebrates, birds, fish, wildlife, and humans. The purpose of the CSM is to identify the specific exposure pathways and receptors that are related to sediment contamination in the removal action area. This information was used to develop the Removal Action alternatives and will facilitate analysis of the residual (i.e., post-Removal Action) risks to ecological and human receptors following implementation of the Removal Action.

Removal Action Objectives

Section 4 reviews the RAOs initially established in the EE/CA work plan (BBL, 2004a), which are to:

- Reduce ecological and human health risks associated with sediment contamination within the Removal Action Area to acceptable levels.
- Reduce the likelihood of recontamination of sediments within the Removal Action Area.

The ability to achieve RAOs is one component of the evaluation of Removal Action alternatives. It is important to note that the Removal Action focuses on sediments within the Removal Action Area. The Removal Action will ultimately be part of the overall Remedial Action associated with the Portland Harbor Superfund Site. As such, the Removal Action is not intended to address all exposure pathways and environmental media within Terminal 4. The need for environmental cleanup for media other than sediments is being addressed by other programs, most notably the harborwide RI/FS under an Administrative Order on Consent with USEPA and the Upland Source Control program under Voluntary Cleanup Program agreements with DEQ. Achieving the RAOs for all receptors and pathways will be through a combination of actions resulting from all of the environmental programs.

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Technology Screening

Section 5 summarizes the process through which technologies were screened to determine their appropriateness for inclusion in the development of Removal Action alternatives.

The Terminal 4 EE/CA work plan (BBL, 2004a) identified general technologies that would be considered for inclusion in the development of Removal Action alternatives. In accordance with USEPA guidance (USEPA, 1993) for NTCRAs, "only the most qualified technologies that apply to the media or source of contamination" should be considered. On that basis, the EE/CA work plan identified the following technologies for consideration in the development of Removal Action alternatives:

- monitored natural recovery (MNR), which may be applicable to portions of the Removal Action Area with low contaminant concentrations;
- in-situ capping of contaminated sediment; and
- sediment dredging (both mechanical and hydraulic) followed by auxiliary technologies such as transport, treatment, and/or onsite disposal of dredged sediments in a confined disposal facility (CDF) or offsite disposal of dredged sediments.

The Port screened these potentially applicable technologies to identify the technologies that are feasible and implementable at Terminal 4 and then assembled the Removal Action alternatives to include the screened technologies as components. Other factors considered in the development of the alternatives were the physical, chemical, and operational characteristics of the Removal Action Area and community feedback. In accordance with the AOC, the feasible and implementable technologies and a suite of Removal Action alternatives were presented to the USEPA, the DEQ, the Tribes, and the Trustees in a technical briefing on October 29, 2004.

Most of the technologies considered were found to be feasible, available, and applicable to the characteristics of Terminal 4, as summarized below.

- The screening analysis of MNR (which is discussed in Appendix B and detailed in Appendix H) resulted in a finding that MNR is a viable technology for a portion of Berth 401, a portion of Slip 1, a portion of Wheeler Bay, and the North of Berth 414 subarea. MNR has therefore been incorporated into the Removal Action alternatives.
- The screening analysis of capping technologies (which is discussed in Appendix B and detailed in Appendix I) resulted in a finding that capping in general is a technically feasible technology. Capping has therefore been incorporated into the Removal Action alternatives. The types of caps that might be needed to control erosion on steep slopes, such as concrete mattresses, were retained for further consideration during the design phase. Sand or gravel caps were retained for further consideration in parts of the Removal Action Area where the slopes are less steep and areas are less exposed to hydraulic forces and erosional impacts.

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- The screening analysis of dredging technologies (which is discussed in Appendix B and detailed in Appendix J) resulted in a finding that dredging in general is a technically feasible technology. Dredging has therefore been incorporated into the Removal Action alternatives. Dredge types with wide availability and applicability to the Removal Action Area are mechanical dredge with open clamshell bucket, mechanical dredge with enclosed clamshell bucket, and hydraulic cutterhead dredge and hydraulic dredge, which was retained for possible use in conjunction with onsite disposal in a CDF.
 - The screening analysis of transport technologies for dredged sediment (Appendix B) resulted in a finding that all the technologies considered (rail, barge, and truck and, for onsite disposal in a CDF, pipeline) are feasible, and none of the technologies was eliminated from consideration for the Terminal 4 Removal Action.
 - The screening analysis of treatment technologies for dredged sediment (Appendix B) resulted in a finding that none of the treatment technologies considered (thermal treatment, extraction, chemical treatment, biological treatment/bioremediation, and immobilization) is appropriate for inclusion in the Removal Action alternatives. Treatment technologies for dredged sediment are either not feasible, not commercially available, or not applicable to the types of contaminants that are prevalent at Terminal 4. In addition, none of the surveyed vendors offering a process with potential applicability to the Removal Action Area sediments was interested in pursuing a project of this limited size and duration.
 - The screening analysis of disposal technologies for dredged sediment (Appendix B) resulted in a finding that onsite disposal in a CDF and offsite disposal at a USEPA-approved landfill are both technically feasible technologies. Both disposal technologies have therefore been incorporated into the Removal Action alternatives. Appendix K details the evaluation of CDF feasibility.
 - In addition, certain materials handling processes, such as dewatering and stabilization, were retained as technologies that may be considered to facilitate transportation and disposal of dredged sediment.

Applicable or Relevant and Appropriate Requirements

Section 6 identifies the legally applicable or relevant and appropriate requirements (ARARs) that may govern the Terminal 4 Removal Action. The ARARs fall into three classifications:

- Location-specific requirements are restrictions on activities based on the characteristics of a site or its immediate environment.
- Chemical-specific requirements are health- or risk-based concentration limits or ranges for specific hazardous substances, pollutants, or contaminants in various environmental media.
- Action-specific requirements are controls or restrictions on particular types of activities such as hazardous waste management or wastewater treatment.

In addition, the USEPA has developed another category called "to be considered" (TBCs), which includes non-promulgated criteria, guidance, and proposed standards issued by federal or state governments. While

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compliance with TBCs are not mandatory, TBCs may provide guidance on how to carry out certain actions or requirements

The ability of the Removal Action alternatives and the Preferred Alternative to achieve compliance with ARARs is a threshold criterion that must be met for this action.

Identification of Removal Action Alternatives

Section 7 summarizes the process by which Removal Action alternatives were developed and describes the alternatives. Following an analysis of the chemical, physical, and operational characteristics of the Removal Action Area's five subareas (Slip 1, Berth 401, Slip 3, Wheeler Bay, and the North of Berth 414 area), applicable technologies – monitored natural recovery, sediment capping, and/or sediment dredging with onsite or offsite disposal – are determined for each subarea. Five Removal Action alternatives addressing all five subareas are then assembled:

- No Action Alternative (required by statute as baseline against which to evaluate the other alternatives);
- Alternative A – MNR Emphasis;
- Alternative B – Cap Emphasis;
- Alternative C – Dredge Emphasis with CDF Disposal; and
- Alternative D – Dredge Emphasis with Landfill Disposal.

Alternatives A, B, C, and D all have MNR, capping, and dredging as components of the Removal Action, but vary in the degree to which they apply the technologies deemed feasible for Terminal 4. For instance, the estimated volume of dredged sediment ranges from 105,000 cubic yards (cy) under Alternatives A and B, which emphasize monitored natural recovery and capping, to 204,000 cy under Alternative D, which emphasizes dredging as a principal component. Only Alternative C includes onsite disposal of the dredged material in a CDF. Detailed descriptions of Alternatives A through D and how they would be applied in the five subareas are provided in Section 7.

Evaluation of Removal Action Alternatives

Section 8 evaluates the Removal Action alternatives, both individually and comparatively, for:

- effectiveness, as evidenced through the evaluation criteria of overall protection of public health and the environment; compliance with ARARs; long-term effectiveness; reduction of mobility, volume, and toxicity of wastes; and short-term effectiveness;
- implementability, as evidenced through the evaluation criteria of technical and administrative feasibility and availability; and
- cost.

Alternatives A, B, C, and D are all found to be effective and implementable. The estimated costs (total net present value) of the alternatives are \$23,303,000 for Alternative A, \$24,627,000 for Alternative B, \$30,555,000 for Alternative C, and \$26,431,000 for Alternative D. The CDF in Alternative C offers excess capacity that could be used for the disposal of contaminated sediments from other sites within the Portland Harbor Superfund

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Site, as well as for the placement of other suitable sediments or fill; the estimated value of this excess capacity is placed at \$10,000,000. Incorporating the estimated value of the excess capacity of the CDF, the net estimated cost of Alternative C is approximately \$20,555,000.

On the basis of a comparative evaluation of the Removal Action alternatives against the CERCLA criteria, the alternatives are ranked by their scores on a scale of -1 to 1, in which -1 indicates an alternative is less favorable than the compared alternative; 0 indicates the two compared alternatives are equal; and 1 indicates an alternative is favored over the compared alternative. The four active alternatives are ranked in the following order:

- Alternative C (overall average score of 0.1333) is ranked the highest, reflecting its greatest overall relative performance at meeting the requirements of the evaluation criteria.
- Alternative B ranks second (overall average score of -0.1111).
- Alternative A ranks third (overall average score of -0.1222).
- Alternative D is considered to exhibit the least overall relative performance at meeting the requirements of the evaluation criteria and as a result ranks lowest of the four active alternatives (overall average score of -0.3).

The No Action alternative is not ranked, because it fails to meet the threshold criteria.

Preferred Alternative

Section 9 draws on the comparative analysis and ranking of alternatives and on USEPA guidance for conducting NTCRAs to identify the Preferred Alternative and provide the rationale for its selection. Alternative C is the Preferred Alternative because it best meets the evaluation criteria. Alternative C will meet the substantive requirements of the ARARs and offers greater overall protection of human health and the environment than do the other alternatives, because:

- The most contaminated sediment will be contained in a CDF designed and constructed to be protective of human health and the environment.
- Handling and transport of the contaminated sediments are minimized and kept within the Terminal 4 facility.
- The construction activities associated with implementation of the Preferred Alternative are essentially confined to the Terminal 4 facility, with little impact to the local community.
- The short-term risk of recontamination during implementation is minimized because a relatively small volume of sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the Willamette River by a berm.
- The long-term risk of recontamination is reduced because Slip 1 is eliminated.

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The Preferred Alternative is expected to exhibit relatively high short-term effectiveness, since its main components of dredging and CDF construction represent relatively little risk to the community, to site workers, and to the environment, and the duration of these activities is relatively short.

In addition, Alternative C is most compliant with the NTCRA requirement "to avoid wasteful, repetitive, short-term actions that do not contribute to the efficient, cost-effective performance of a long-term remedial action" (USEPA, 1993). Alternative C has the potential to contribute to the efficient, cost-effective performance of a long-term remedial action for the entire Portland Harbor Superfund Site because it provides a CDF disposal option that is nearby, efficient, and cost-effective and that decreases sediment management and handling.

Land created by filling Slip 1 would be used for water-dependent purposes consistent with existing zoning and current Port marine use at the Terminal 4 facility.

Recontamination Potential

The Preferred Alternative must also achieve the RAO of reducing the likelihood of recontamination of sediments within the Removal Action Area. Section 10 (reserved for this draft) presents an analysis of the recontamination potential of the Preferred Alternative.

Removal Action Process

Upon the approval of this EE/CA, USEPA will issue an Action Memorandum to document the selection of the removal action alternative proposed for implementation. Following the Action Memorandum, the Port is required to prepare a number of additional deliverables specified in the AOC and SOW prior to removal action construction activities. For the Removal Action design and implementation, these include:

- Removal Action Design Documents including construction drawings and specifications at various completion levels such as conceptual level (representing a 30% completion), pre-final (representing a 60% level of completion) and final, i.e., 100% complete design documents; and a
- Removal Action Work Plan that will describe the construction activities and their schedule, and will also include procedures to protect the public, site workers and the environment during field activities, and construction quality assurance procedures to ensure that the Removal Action Objectives and performance standards will be met.

The removal action design will involve the preparation of design calculations and analyses to work out design details, the preparation of design drawings, specifications, setting performance standards and procedures to verify that RAOs have been met. This design development process will gradually increase the specificity of the project details, in terms of refining areas and volumes of sediment involved, selecting construction processes, technology and equipment, disposal facilities and material borrow sources, and other project particulars. This process will culminate in the final (100%) design documentation that will provide specific project execution requirements and a combination of prescriptive specifications (where deemed necessary) and performance requirements (where appropriate to allow flexibility to contractors). The 100% (final) design will be used to competitively procure contractors for the implementation of the removal action in the field.

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Construction of the Removal Action may affect aquatic environments in the Removal Action Area depending on the Alternative that is selected by USEPA. In accordance with the Clean Water Act, the Port will design and implement appropriate mitigation to offset the impacts to aquatic habitat. The mitigation planning process will proceed in parallel with the removal action design, and a final mitigation plan will be submitted with the final project design.

Upon the completion of the removal action field activities, the Port will prepare the Removal Action Completion Report and will also submit a Long-Term Monitoring and Reporting Plan and will commence long term monitoring activities.

Throughout the process, the Port has maintained an extensive community outreach effort, coordinated with EPA's community involvement programs and also coordinated with DEQ. This effort will continue through final construction of the Removal Action.

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APPENDIX B

Responsiveness Summary for Public Comments on the Engineering Evaluation/Cost Analysis, Terminal 4 Removal Action

EPA Responsiveness Summary
Terminal 4 Removal Action
Portland, Oregon

Introduction -

This document summarizes and responds to the public comments submitted on the Engineering Evaluation and Cost Analysis (EE/CA) for the proposed Removal Action at the Port of Portland Marine Terminal 4 in Portland, Oregon.

The EE/CA was available for public review and comment from June 6 until September 7, 2005. Notice of this comment period was published in the Oregonian at the start of the initial 30-day public comment period. Notices announcing two subsequent extensions of the comment period were also published in the Oregonian. Additionally, notice of the comment period and a summary of the proposed EE/CA alternatives were described in a Portland Harbor Fact Sheet (June 2005) that was mailed to approximately 900 addresses.

Overview and general responses to all comments received

A total of eighty-nine responses were received during the public comment period. Seventy-four individuals, groups and businesses provided comments by letter and e-mail during the comment period. In addition, fifteen individuals provided spoken comment during the public meeting. Each submission was reviewed by the EPA project manager and other members of the Portland Harbor project team. Responses to all comments are provided below.

Many of the eighty-nine commenters provided feedback on more than one subject, resulting in over 450 specific comments.

CDF - One hundred forty-four comments referred to the proposed construction of a confined disposal facility (CDF) in Terminal 4 Slip 1. The largest group of these comments provided unqualified statements of opposition or concern about placing a CDF at Terminal 4. Many other respondents cited various reasons for having concern about the CDF. The most common concern stated was the ability of the CDF to withstand a catastrophic event such as earthquake or flood. Many respondents from the surrounding communities of St. Johns, Linnton and Cathedral Park, were opposed to the CDF because of the proximity to their homes. Other reasons cited by more than one respondent included leaching, erosion or leaking, the effect on fish and wildlife habitat, unknown or unspecified risk, and costs and economics. One comment stated support for the CDF.

EECA - Forty nine comments were about various aspects of the Engineering Evaluation and Cost Analysis. Several comments questioned how the alternatives were ranked, the adequacy of the analysis or the cost of the EECA or cleanup. Several comments identified missing information or requested additions they would like to see in the EE/CA. Approximately half of the comments related to the EE/CA asked for clarification or explanation from a specific page or section of the EE/CA.

Cleanup - Forty-four comments made generic statements about cleaning up the Willamette River, Portland Harbor or Terminal 4. About half of these comments expressed general support of EPA efforts to clean up the river. Several comments asked about the relationship of the Terminal 4 early action to the harbor-wide cleanup. Several comments identified cleanup concerns or priorities such as timing, cost, toxic materials, early actions, future use industrial use, contaminant migration, and objectives. (One comment asked EPA to continue this effort to clean up the Columbia and one comment support the OCEH plan to clean up the river.)

Landfill – Thirty six comments recommended that contaminated sediment dredged from the river should be disposed of in a hazardous waste landfill.

Alternatives – Thirty four comments related to alternatives presented in the EE/CA. Twenty-three comments were specific to the preferred alternative (Alternative C) identified in the EE/CA. Eight comments stated opposition to the preferred alternative, four comments expressed concern about the preferred alternative and the remaining comments related to the effect of the preferred alternative on fish, risk, cost or neighborhood concerns. Six comments urged EPA to select Alternative D and five comments asked to have additional alternatives developed.

Cost – Twenty four comments expressed concern over various aspects of the cost of the proposed action to the port or to the taxpayer.

Trust – Eighteen comments identified trust as an issue. Eleven comments talked about trusting the Port of Portland to do the right thing, three comments were specific about trust issues for EPA and four comments did not specify a party.

Disposal – Seventeen comments were regarding disposal of contaminated sediment and related issues such as capping, neighborhood concerns, and risk.

Monitoring – Fourteen comments questioned how the cleanup remedy would be monitored. One or more comments identified an aspect of monitoring such as fish and wildlife, strategy, or timing.

Public involvement – Twelve comments addressed the timing or adequacy of public involvement.

Risk – Nine comments identified risk as an issue or concern.

Dredging – Seven comments discussed dredging as part of the Terminal 4 Action. Three comments supported hydraulic dredging, and one comment was opposed to dredging.

Capping/Monitored Natural Recovery – Seven comments discussed capping and/or monitored natural recovery. Five comments supported these sediment cleanup tools and two comments opposed their use.

Economics - Four comments questioned the economics of the proposed action or analysis.

Other topics raised by one or two comments included: economics, mitigation, future use, treatment technology, air, human health, human use, neighborhood concerns restoration, sediment, and water quality.

| | Comment Author | Date/Method of Commenting |
|-----|---|---|
| 1. | (b) (6) | 6/9/05 email |
| 2. | Portland, OR | 6/11/05 email |
| 3. | (b) (6) Portland, OR | 6/9/05 letter |
| 4. | (b) (6) & Family | 6/9/05 letter |
| 5. | (b) (6) Portland Rowing Club Portland, OR | 6/8/05 letter |
| 6. | Oregon Bass & Panfish Club Portland, OR (b) (6) Information Officer | 6/13/05 letter |
| 7. | (b) (6) Portland, OR | 6/22/05 email |
| 8. | (b) (6) Portland, OR | 6/22/05 email |
| 9. | (b) (6), MD | 6/22/05 email |
| 10. | (b) (6) Portland, OR | 6/22/05 email |
| 11. | (b) (6) | 6/22/05 email |
| 12. | Portland, OR | 6/22/05 email |
| 13. | (b) (6) Forest Grove, OR | 6/22/05 email |
| 14. | (b) (6), PhD | 6/22/05 email |
| 15. | (b) (6) Vancouver, WA | 6/22/05 email |
| 16. | (b) (6) | 6/22/05 email |
| 17. | | 6/22/05 email |
| 18. | Portland, OR | 6/22/05 email |
| 19. | (b) (6) Portland, OR | 6/22/05 email |
| 20. | (b) (6) | 6/22/05 email |
| 21. | Lake Oswego, OR | 6/22/05 email |
| 22. | (b) (6) | 6/22/05 email |
| 23. | | 6/23/05 email |
| 24. | | 6/23/05 email |
| 25. | Beaverton, OR | 6/23/05 email |
| 26. | (b) (6) Beaverton, OR | 6/23/05 email |
| 27. | Linnton Neighborhood Association Portland, OR (b) (6) | 6/23/05 letter originally provided in hard copy at public hearing 6/23/05; followed up with 6/30/05 |

| | Comment Author | Date/Method of Commenting |
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| | Environmental Chai | email with letter attached |
| 28. | Willamette Riverkeeper Portland, OR (b) (6) Riverkeeper & Executive Director | 6/23/05 letter |
| 29. | (b) (6) Tualatin, OR | 6/24/05 email |
| 30. | (b) (6) Executive Director, Camp/Retreat Ministries Oregon-Idaho Conference United Methodist Church Portland, OR | 6/25/05 email |
| 31. | (b) (6) Portland, OR | 6/26/05 email |
| 32. | (b) (6) | 6/24/05 email |
| 33. | | 6/27/05 email |
| 34. | Portland, OR | 6/27/05 email |
| 35. | (b) (6) | 6/28/05 email |
| 36. | Portland, OR | 1/7/04 email (forwarded by Sean on 6/29/05, unclear why date stamp on original email is so skewed) |
| 37. | (b) (6) Portland, OR | 6/29/05 email |
| 38. | (b) (7)(A) Beaverton, OR | 6/22/05 letter |
| 39. | (b) (6) Newberg, OR | 7/2/05 email |
| 40. | (b) (6) Portland, OR | Undated comment form (received copy from EPA 7/5/05) |
| 41. | (b) (6) Hillsboro, OR | 6/25/05 letter |
| 42. | (b) (6) West Linn, OR | 7/3/05 email |
| 43. | (b) (6) Portland, OR | 7/4/05 email |
| 44. | (b) (6) Portland, OR | 7/9/05 email |
| 45. | (b) (6) Portland, OR | 7/9/05 email |
| 46. | (b) (6) | 6/26/05 email |
| 47. | Portland, OR | 7/8/05 letter |
| 48. | (b) (6) President, L.D. Tonsager & Sons, Inc. | 7/21/05 email |
| 49. | (b) (6) Portland, OR | 7/23/05 email |
| 50. | (b) (6) | 7/24/05 email |
| 51. | h West Linn, OR | 7/25/05 email |

| | Comment Author | Date/Method of Commenting |
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| 52. | (b) (6) Portland, OR | 7/25/05 email & attached letter |
| 53. | (b) (6) | 8/5/05 email |
| 54. | (b) (6) Willamette Riverkeeper | Transcript of comments from 6/23/05 public hearing |
| 55. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 56. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 57. | (b) (6) Oregon Center for Environmental Health | Transcript of comments from 6/23/05 public hearing |
| 58. | (b) (6) Linnton Neighborhood Association | Transcript of comments from 6/23/05 public hearing |
| 59. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 60. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 61. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 62. | (b) (6) Oregon Center for Environmental Health | Transcript of comments from 6/23/05 public hearing |
| 63. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 64. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 65. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 66. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 67. | (b) (6) | Transcript of comments from 6/23/05 public hearing |
| 68. | (b) (6) Portland, OR | 8/7/05 email |
| 69. | (b) (6) | 8/7/05 email |
| 70. | (b) (6), President Oregon Bass & Panfish Club Portland, OR | 8/11/05 email & attached letter |
| 71. | Breck Barton President Cereal Food Processors, Inc. Kansas City, MO | 8/8/05 letter |
| 72. | (b) (6) President Waterfront Organizations of Oregon Portland, OR | 8/17/05 email and attached letter dated 8/15/05 |
| 73. | (b) (6) Portland, OR | 6/23/05 letter – script of testimony not given for 6/23/05 public hearing; provided by EPA 8/22/05 |
| 74. | Portland Harbor Community Advisory Group (b) (6) Chair Portland, OR | 8/20/05 letter |

| | Comment Author | Date/Method of Commenting |
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| 75. | (b) (6) Senior Legal Counsel, Western Group Legal Department Waste Management, Inc. Seattle, WA | 9/2/05 email and attached letter dated 9/2/05 |
| 76. | Friends of Cathedral Park (b) (6), Land-Use Chair | 9/4/05 email and attached letter dated 8/29/05 |
| 77. | (b) (6) Portland, OR | 8/30/05 letter |
| 78. | (b) (6) Portland, OR | 9/7/05 email from Sierra Club with comments sent of behalf of (b) (6), dated 8/30/05 |
| 79. | (b) (6) Portland, OR | 9/7/05 email from Sierra Club with comments sent of behalf of (b) (6), dated 8/30/05 |
| 80. | (b) (6) Tualatin, OR | 9/7/05 email from Sierra Club with comments sent of behalf of (b) (6) |
| 81. | (b) (7)(A) Oregon City, OR | 9/7/05 email from Sierra Club with comments sent of behalf of (b) (6), dated 8/30/05 |
| 82. | Jon N. Robbins Senior Counsel Law Department Chevron U.S.A. Inc. San Ramon, CA | 9/7/05 email and attached letter |
| 83. | (b) (6) Portland, OR | 9/7/05 email and attached letter |
| 84. | (b) (6) Executive Director Oregon Center for Environmental Health Portland, OR | 9/7/05 email and attached letter dated 9/6/05 |
| 85. | Kristan Mitchell Government Affairs Director Oregon Refuse and Recycling Association Salem, OR | 9/7/05 email and attached letter |
| 86. | Dean Marriott Director, Bureau of Environmental Services City of Portland Portland, OR | 9/7/05 email and attached letter |
| 87. | Rick Kepler Oregon Department of Fish and Wildlife Manager, Water Quantity/Quality Salem, OR | 9/7/05 email and attached letter |
| 88. | (b) (6) Chair of the Columbia Group, Sierra Club Portland, OR | 9/5/05 letter |
| 89. | (b) (6) Chairman St. Johns Neighborhood Association Portland, OR | 9/5/05 letter |

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| Golder | 1 | <p>NOTE: The entire Golder Report is not reproduced herein. The comments included below and responded to by EPA were taken from the conclusions of the report (Technical Issues 1 – 6).</p> <p>Issue 1: Seismic Design Regulations</p> <p>The technical memorandum states that "if the proposed CDF was regarded as a landfill, then Federal and Oregon state regulations will require" significantly higher level of seismic analysis and design than what was used in the EE/CA.</p> | <p>EPA agrees that if the CDF was regarded as a solid waste landfill, there are specific federal regulations on seismic analysis and design for those types of facilities. However, the CDF is not a landfill under Federal regulations. Also, the preliminary seismic analysis and design completed for the EE/CA (and which will be refined during the design of the CDF), was completed to standards set forth for other similar in-water facilities, which were determined by the Oregon Department of Environmental Quality ("DEQ") to be comparable to requirements under potentially relevant state regulations.</p> <p>State and federal regulations governing solid waste landfills including, but not limited to, the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. Section 6901, et seq., and 40 CFR Part 258 are not applicable or relevant and appropriate requirements (ARARs) for the siting, design and construction of the Terminal 4 CDF. Additionally, the contaminated sediment to be disposed of in the CDF at Terminal 4 are not hazardous wastes, thus, federal and state requirements related to hazardous waste disposal are not ARARs.</p> <p>Under the federal solid and hazardous waste program, sediment is an environmental media, and environmental media are not solid wastes, and thus are not hazardous wastes. However, if an environmental media contains a listed hazardous waste or exhibits a characteristic of a hazardous waste (40 CFR 261 Subpart C), it may need to be managed as hazardous waste depending on how it is handled and disposed. Nonetheless, dredged material, including environmental media such as sediments containing hazardous substances, that are managed and disposed under the requirements and protocols of the Clean Water Act, 33 U.S.C. Section 1251, et seq. are exempt from the definition of hazardous waste under the federal RCRA program, 40 CFR 261.4(g).</p> <p>Furthermore, the RCRA regulations related to the siting, design and construction of solid waste landfills are not well suited to CDFs for the following main differences:</p> <p>Subtitle D Landfills (solid waste landfills) are</p> <ul style="list-style-type: none"> constructed in a land environment to receive a broad range of waste streams from the general public (e.g., municipal waste), and commercial and industrial operations. Although solid wastes do not exhibit the characteristics of hazardous waste (e.g., certain toxicity concentrations), these various wastes are typically contaminated with an unknown number of hazardous substances, many of them readily leachable. Because the landfill is intended to be a land environment, when the waste in the landfill is exposed to moisture and air, it creates an environment in which they interact, decompose, oxidate and leach. Production of leachate and gas are natural consequences of these processes, and of landfills. Due to the broad range of material accepted and the exposure of these wastes to moisture and air, landfills require liners and leachate collection and removal systems; run-on and run-off controls; and landfill gas collection systems. <p>In contrast, the proposed Terminal 4 CDF would be designed and constructed</p> <ul style="list-style-type: none"> To contain stable, well-characterized contaminated sediment which exhibit inherently low leaching potential. Sediments (and soil/fill) are the only material that would be placed in the CDF. The type of sediment accepted is limited; acceptance criteria are developed specific to the site conditions and CDF design. To accept sediments only. Since the sediments will not be mixed with various solid wastes, there will be no inter-reaction, oxidation, generation of leachate, or generation of gas that would warrant Subtitle D-like containment and monitoring systems. To place the impacted sediments within a specific hydrogeologic setting (i.e., the saturated zone), which is not favorable for leaching to develop. |

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| | | | <p>• To withstand design-specific flood and seismic events. In general, the contaminants of concern only pose a chronic risk to aquatic receptors and any breach of the CDF leading to a release, although not likely, would not represent an immediate and significant danger to ecological receptors.</p> <p>In summary under federal law, the operational method, the type of material a CDF contains, the aquatic environment in which a CDF is sited, and the low-level risk that the sediment allowed to be placed in the CDF will represent is vastly different from those of landfills, therefore federal design or operational requirements for a solid waste landfill are not deemed relevant and appropriate for this response action.</p> <p>Oregon solid and hazardous waste disposal requirements also are not ARARs for this removal action, but for different reasons. Under Oregon law, dredged sediment requiring disposal is regulated as a solid waste, OAR 340-093-0030(82). Oregon adopted the federal hazardous waste identification rule, OAR 340-100-0002. Thus, if dredged material containing hazardous substances is managed and disposed under the requirements and protocols of the Clean Water Act, 33 U.S.C. Section 1251, et seq., such dredged materials are exempt from the definition of hazardous waste under Oregon's hazardous waste regulations.</p> <p>The Oregon Department of Environmental Quality (DEQ) evaluated the question of state solid waste regulations as applicable or relevant and appropriate requirements for the CDF. DEQ concluded that certain portions of the state solid waste regulations are relevant and the proposed removal action already incorporates many of them. In addition, DEQ concluded that certain portions of other relevant state solid waste regulations will be imposed on the Terminal 4 Removal Action during design and implementation, such as:</p> <ul style="list-style-type: none"> • Construction Certification • Operation Plan • Monitoring Discharge to the River • Closure Plan • Site Monitoring • Develop Financial Assurance <p>Therefore, since the potentially relevant and appropriate state solid waste regulations are not more stringent than federal law requirements, state solid waste regulations are not considered ARARs for the Terminal 4 CDF.</p> |
| Golder | 2 | <p>Issue 2: Seismic Design Earthquake</p> <p>The technical memorandum states that "This two level seismic design approach proposed by BBL is reasonable for seismic design of the CDF". Further the technical memorandum recommends "that the ground motions for the OLE event have a return period of 475 years and the ground motions for the CLE event have a return period of 2,475 years".</p> | <p>The EE/CA applied the 475 years CLE and 75 years OLE to the CDF design analysis. The U.S. Army Corps of Engineers (USACE) provides guidance for the design of confinement facilities for dredged material (USACE, 1987). USACE defines an Operating Basis Earthquake (OBE) as having "a 50-percent probability of exceedance during the service life." For non-critical structures, such as a CDF, the MDE (Maximum Design Earthquake) shall be selected as a lesser earthquake than the MCE (Maximum Credible Earthquake) which provides economical designs meeting appropriate safety standards. A critical feature is one "whose failure during or immediately following an earthquake could result in loss of life" (USACE, 1995). Failure of the CDF would not result in loss of life, and therefore would not be considered a critical feature. The selection of 75- and 475-year return periods for the OLE and CLE, respectively, are appropriate.</p> <p>The CDF would be designed so that seismic-induced deformations would be limited to about 0.5m due to the OLE. For the CLE, the CDF would be designed to allow for larger deformations, but complete berm failure and release of contaminated sediments would not occur.</p> <p>References:</p> |

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| | | | <p>USACE. 1987. Confined Disposal of Dredged Material. EM 1110-2-5027. 30 September.</p> <p>USACE. 1995. Earthquake Design and Evaluation for Civil Works Projects. ER 1110-2-1806. 31 July.</p> <p>USACE. 2003. Slope Stability. EM 1110-2-1902. 31 October</p> |
| Golder | 3 | <p>Issue 3: Selection of Acceleration Time Histories</p> <p>The technical memorandum states that "BBL selected acceleration histories from both shallow earthquakes (2,475-year hazard) and subduction zone earthquake events (475-year hazard). We believe that the acceleration time histories chosen by BBL are inappropriate for comprehensive evaluation of the earthquake response at the site."</p> | <p>According to the Golder report, the acceleration time histories are appropriate for the 475-year return period event. As stated above, USACE guidelines support the use of this return period. Thus, the acceleration time histories are conservative and suitable for a feasibility-level evaluation. During final design of the CDF, a more rigorous search for appropriate earthquake time histories will be completed, considering distances to source(s), recorder site conditions, magnitude, duration, and frequency content.</p> |
| Golder | 4 | <p>Issue 4: Site Response Analyses</p> <p>The technical memorandum states that "the use of 1D site response analyses for the dynamic stability of the two-dimensional CDF berm may not be appropriate."</p> | <p>In general, a 1-D analysis can provide valuable insight as to whether or not liquefaction and/or seismic deformations could result in unacceptable performance of the CDF. The 1-D analysis completed for this project indicates that seismic stability is an issue that must be addressed. Consequently, 2-D seismic stability analyses will be completed as a part of final design of the CDF.</p> <p>Recent project example (Kettle River Tailings Dam Expansion) indicates that Washington Department of Ecology Dam Safety Office agrees with the use of ProShake for dams; tailings dam design is quite similar in its nature to the design of a CDF berm.</p> |
| Golder | 5 | <p>Issue 5: Liquefaction under and inside the CDF berm</p> <p>The technical memorandum states that "considerable uncertainties exist when back analyzing case histories. Most researchers agree that the residual strength of liquefied soils should be presented as a function of the overburden pressure (Ishihara, 1996). This approach will result in lower shear strengths at the surface of the liquefied solid and potentially higher strengths at depth. BBL calculated one average value for the entire liquefied zone. This approach may not be appropriate for the CDF berm stability evaluation"</p> <p>The technical memorandum further states that the "berm will be constructed hydraulically", implying that these fills are particularly prone to liquefy.</p> | <p>The EECA used a feasibility evaluation level analysis to evaluate conservative soil strength parameters on select, expectedly critical cross-sections. During final design of the CDF more cross-sections of various construction scenarios with different fill configurations will be analyzed.</p> <p>The analyses performed by Golder include some very conservative assumptions. If these recommendations were implemented here, the resulting design would far exceed appropriate safety standards. Some of the conservative assumptions include:</p> <ul style="list-style-type: none"> • The Technical Memorandum presents the results of a seismic stability analyses performed considering 0.42g PGA (2,475 year return period seismic event) see Figure 2-4, which far exceeds USACE design guidance for CDFs. • Golder suggests that residual strength of the soil should be considered a function of soil overburden, and assume $S_u/s'v = 0.08$. Other published data (Olson and Stark, 2003) suggest that this value could be 50% higher (i.e., $S_u/s'v = 0.12$). • The concept for the construction of the berm set forth in the EE/CA report is considerably more robust than assumed in the comment. Specifically, rock training terraces and a sand and gravel core would be used to create a stable structure. See appendix K of the EE/CA report for more specific information on proposed construction materials and methods. <p>Hydraulic placement i.e., slurring material into its final place is not intended. The design will establish specifications for the selection and placement of the berm material, it can be assumed at even this early stage of the project, that a relatively well-graded, sandy gravel material will be placed, using clamshell placement. CDFs in the Pacific Northwest are normally built by the use of select granular material placed within the confining training berms constructed from quarry spalls. See appendix K of the EE/CA Report.</p> <p>Reference: Olson and Stark. 2003. Yield Strength Ratio and Liquefaction Analysis of Slopes and Embankments.</p> |

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| | | | <i>Journal of Geotechnical and Geoenvironmental Engineering. 129(8):727-737</i> |
| Golder | 6 | <p>Issue 6: Seismic Settlement of Soils</p> <p>The technical memorandum states "the liquefaction of the alluvial soils could result in significant settlement of the berm Liquefaction of the CDF berm ... will likely lead to the catastrophic failure of the berm".</p> | <p>The technical memorandum does not define the term catastrophic failure and are interpreted based on results of analyses considering a 2,475-year return period earthquake – significantly above standard practice for design of CDFs.</p> <p>The analyses completed by BBL for the EE/CA and Golder's comments all indicate that CDF berm is susceptible to seismic deformations. These deformations will be evaluated in accordance with the responses noted above and designs modified as appropriate in order to meet appropriate design guidelines. Preventative measures, such as increasing the height of the berm or in situ densification of foundation soils may be considered during design if they are warranted.</p> <p>The CDF Operation and Maintenance Plan, discussed in Section 9 of the EE/CA, will be developed to include measures to respond to large deformations of the berm.</p> |
| 1 | 1 | I object to the burial of the contaminated soil in the Terminal 4 trench. | <p>The confined disposal facility will be a highly-engineered disposal facility. The primary engineering objectives will be permanence and effective containment of the contaminants placed inside. EPA's Action Memorandum has set out initial criteria regarding the nature of the sediments that may be disposed of in the CDF. Additional criteria will be developed. The primary purpose of all of the criteria is to ensure that the contaminants disposed of will stay confined. Because of the high level of community concern over the types of material that would be placed in a CDF, EPA will include a public input process when developing the final screening criteria for determining the type of sediment suitable for disposal within the CDF.</p> <p>The proposed removal action has undergone a rigorous evaluation against risk-based criteria, relative effectiveness (e.g., long-term effectiveness and permanence), implementability, RAOs, community considerations, and costs. A number of design issues have been evaluated in the EE/CA or will be required by EPA to be evaluated and implemented during the design to ensure the long-term integrity of the CDF. This includes: 1) earthquake issues, 2) flood events, 3) groundwater passing through the CDF, 4) short-term impacts such as placement of sediment and settling, and monitoring, closure plan, and post construction certification. Specific considerations can be found in the EE/CA or will be available once the design documents are complete.</p> <p>EPA has identified a number of benefits for the CDF:</p> <ul style="list-style-type: none"> ▪ The CDF provides an opportunity to isolate and consolidate contaminated dredged materials on-site. ▪ Dredged material placed in the CDF is contaminated with various substances that are known to be toxic to people and aquatic organisms that use the Willamette River, but none of it failed the tests applied to solid waste to determine if it is hazardous waste (i.e. are chemicals in the waste leachable) even though such tests are not applicable to such material if disposed in an aquatic environment. ▪ Placing dredged materials in a CDF will effectively and safely isolate the contaminants from exposure to people and aquatic organisms. ▪ Construction of the CDF with excess capacity may facilitate long-term remedial action by creating |

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| | | | <p>another disposal option for future consideration in Portland Harbor cleanup decisions. Establishing an in-water disposal site will reduce the overall impact and potential environmental and public safety implications associated with transport of materials to offsite disposal facilities.</p> <ul style="list-style-type: none"> ▪ Having one or more disposal options for the Portland Harbor Superfund site also helps control the cost of disposal because it creates a more competitive market for disposal. ▪ Constructing a CDF at Terminal 4 encourages the consolidation of the contaminated sediments into a limited number of locations and may reduce the area within the Willamette River where contaminated sediments would be contained in place. |
| 1 | 2 | <p>I would like to suggest a better alternative. The alternative is to sanitize the contamination. The proposal is as follows:</p> <p>1) Removal of heavy metals.</p> <p>The method is similar in use at the Kennecott Copper mine in Utah:</p> <ul style="list-style-type: none"> a) Soil is ground to face powder consistency b) Soil is placed in water vats that is aerated by micronized air bubbles c) Air bubbles remove the metals and float to the top. This froth can be scraped and further processed. <p>2) Contaminated water can be de-contaminated using appropriate bacteria.</p> | <p>The treatment process you describe is for heavy metal contamination and is not appropriate for the type of contaminants encountered in Terminal 4 sediments. EPA favors the use of appropriate treatment technology, but we did not find any that were suitable for Terminal 4. Several treatment technologies were evaluated, but ultimately screened from further consideration, including:</p> <ul style="list-style-type: none"> • Thermal treatment, • Extraction, • Chemical treatment (e.g., sanitization, recovery), • Biological/bioremediation, and • Immobilization. <p>These treatment technologies were screened out because of: the requirement for multiple treatment technologies to address different contamination types, the relatively long time required for treatment, and lack of interest in vendors based on the project's limited size (i.e., small volume), duration, and high costs. There is also the potential to create additional waste streams through treatment, which have to be mitigated. For more information, please refer to Section 5.3.3 in the EE/CA.</p> |
| 2 | 1 | <p>As I write this letter there is a major fire occurring at the Schnitzer Steel Products Company which is located on the east bank of the Willamette River in North Portland. Several hook and ladder trucks are pumping water onto a mass of wrecked automobiles. A rather large smoke plume, which is probably toxic, is rising and drifting over North Portland. I mention this because the Schnitzer plant is directly north of the proposed Terminal 4 – Slip 1. Toxic Dump site. As you might imagine, I am surprised that the EPA would seriously consider placing a toxic sediment dump in such an unsafe area.</p> | <p>Contaminated sediments disposed within the CDF are below the surface in an oxygen deficient environment where there is no potential for fires to affect the contents. Please see response to Golder comment 1 for why under federal and state solid and hazardous waste regulations, the CDF is not a hazardous waste disposal site. For other stability or safety concerns, such as earthquake and flooding, please see EPA responses to Golder Comments 1-6.</p> |
| 2 | 2 | <p>I reside almost directly across the Willamette River from Terminal 4 – Slip 1. I am very concerned that the use of the slip as a toxic sediment dump site will have serious ramifications for the several hundred people who permanently reside in my neighborhood.</p> | <p>Because many people in north Portland live in close proximity to the proposed CDF, EPA wants to make sure that your concerns about the long-term safety and integrity of this facility are adequately addressed. EPA intends to solicit additional public input during the design phase regarding the level of contaminated sediment that may be disposed of in the CDF. Furthermore, through EPA's community outreach efforts, we will communicate the type of construction mitigation measures that will be taken to reduce noise and other short-term impacts construction of the CDF may have on the local community.</p> |
| 2 | 3 | <p>[My concerns include:] Health risks from materials moved to the site</p> | <p>Under the proposed alternative, uncontrolled pollution that currently poses a risk to humans and other ecological receptors will be removed and placed into a well designed disposal facility which eliminates potential exposure to contaminants that are isolated. Please see response to Comment 1-1 for additional information on a CDF.</p> |
| 2 | 4 | <p>[My concerns include:] The lack of notification about this proposal to people residing across the river from the site</p> | <p>We are sorry that you did not feel adequately informed about this proposal. EPA used newspaper notices, meetings, and mailings to make sure the community was informed. Community outreach activities are described in more detail in the Action Memo and we are open to suggestions for improving the Community Involvement Plan for Portland Harbor. In addition to the EPA activities, the Port of Portland also conducted a large number of public outreach events. In July 2004, the Port initiated a public outreach program regarding the development of Removal Action alternatives in the attempt to strengthen stakeholder involvement and communication, and to integrate stakeholder input into planning and decision making</p> |

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| | | | activities. The Port met with community groups and hosted open houses to maximize the community's opportunity to obtain information about the project and provide the Port with feedback. In conjunction with participating in community meetings and events, Port staff met with Local and Regional elected officials and their staff to provide them with information and listen to their feedback. During the Terminal 4 Removal Action, EPA will continue with the public involvement process. |
| 2 | 5 | [My concerns include:] The increase in noise and light pollution which may occur during the construction and on-going management of the site | EPA believes it is very important to minimize potential impacts for the neighbors living closest to the site. During the construction and cleanup, short term impacts such as noise, vibrations, traffic will be identified in the Removal Action Work Plan, along with actions needed to be taken to minimize them. The short-term impact to the community from Alternative C is lower than the other alternatives evaluated because construction-related traffic and cleanup activities will be conducted on site at Terminal 4 where access is controlled. Potential community risks associated with exposure to operational hazards such as light, noise and air emissions will be mitigated as specified within the Removal Action Area-specific Health and Safety Plan (HASp). Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms such as dust control. Long-term community impacts from ongoing management of the site are expected to be minimal since the site is located within the Port of Portland's Terminal 4 and is secured. Through EPA's community outreach efforts, EPA will communicate the construction mitigation measures that will be taken to reduce noise and other short-term impacts construction of the CDF may have on the local community. |
| 2 | 6 | [My concerns include:] The fact that the area is on or near an earthquake zone | EPA conducted a rigorous examination of flooding, earthquakes and other catastrophic events during the evaluation of removal action alternatives. The Pacific Northwest is in a seismically active region. As a result, for the CDF to be feasible, the stability assessment of the containment berm (i.e., a main component of the CDF) needed to demonstrate that no contaminated sediments would be released under the design-level loading (i.e., static and seismic) conditions and included: <ul style="list-style-type: none"> • Operating Level Event (OLE) – representing an earthquake with a 50 percent probability of exceedance in 50 years, and • Contingency Level Event (CLE) – representing an earthquake with a 10 percent probability of exceedance in 50 years. Based on these analyses, limited deformations may be possible during and after the OLE, but the berm would remain intact to prevent release of contaminated sediments. Minor repairs along the face of the berm may be required after an earthquake. Under a CLE, large deformations of the berm may occur due to liquefaction of underlying materials, however the release of contaminated sediments is unlikely because of the materials in the berm, the cap and the CDF fill, being largely similar in nature will deform in a relatively compatible manner, without developing a rupture through which contaminated sediments could escape. For additional detail, please see the responses to the <u>Golder Comments</u> . |
| 2 | 7 | [My concerns include:] The possibility of airborne pollutants blowing across the River into the residential area during and after construction. Currently our neighborhood routinely receives a dusting of pot-ash from the ships loading at the dock adjacent to Terminal 4. | The removal action design will include a provision that contaminated sediments must be wet when they are being transported and placed. This will significantly minimize the potential for airborne contaminants at any time. The CDF will be designed with a layer of clean fill to prevent potential escape of dust. Dust from the clean layer will also be minimized. Once completed, the CDF will be paved over for use by Port operations. Pot-ash dust is not involved in this removal action. |
| 2 | 8 | [My concerns include:] The strong possibility of flooding and subsequent erosion that could easily occur. | EPA considered flooding, earthquakes and other catastrophic events in the evaluation of Alternatives. Since Slip 1 of Terminal 4 is located within the mapped 100-year floodplain, this evaluation complied with the Executive Order for Floodplain Management and EPA and Federal Emergency Management Agency (FEMA) regulations. EPA found that during a 100-year flood event the proposed action would have no effect on the surface water elevation of the Willamette River. The rise in flood stage would be negligible and would meet Federal criteria; there are no increases to peak discharge downstream and no noticeable impacts on Willamette River flooding. The design of the proposed action will consider erosional and scouring events of the river both during flood events and under "typical" conditions. |
| 2 | 9 | [My concerns include:] The on-going potential for fire danger in this | See response to <u>Comment 2-1</u> . |

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| | | area. | |
| 2 | 10 | [My concerns include:] Will an evacuation plan for the residents of North Portland and the Linnton neighborhood situated across the river be in place as part of the creation of the dump site? | No actions have been proposed that would require an evacuation plan for the residents of Linnton, St. Johns or Cathedral Park. The proposed action will reduce the risks posed to neighbors from the uncontrolled contamination presently in the river. |
| 2 | 11 | [My concerns include:] I wonder what potential Toyota customers might think if they learned that their new automobile had been parked next to a toxic dump site on its way to the dealership? It certainly would make me think twice about purchasing a Toyota! | The proposed Alternative reduces or eliminates exposure to contaminated sediments and will not affect vehicle offloading at Terminal 4. |
| 2 | 12 | The proposal, as described in the June 8, 2005 Oregonian article, does little to ameliorate any of my concerns. I cannot understand the logic of using the river as a toxic waste dump. If the Willamette River is appropriate as a toxic waste site, why is the city of Portland spending millions of dollars to curtail the flow of sewage into the river? I am in opposition to this foolhardy plan. It seems to me that the only factors under review are cost and expediency. | Multiple environmental problems face the Willamette River. The city effort to prevent raw sewage from being discharged into the river is a separate but important effort to address overall water quality and eliminate ongoing discharges of pollutants into the river. The Superfund cleanup efforts will address unpermitted sources of hazardous substances into the river as well as cleanup contamination in the river from past releases. |
| 2 | 13 | It doesn't really appear that safety and common sense are entering into the planning. Putting a permanent toxic dump site in the heart of a Superfund Clean-Up area would be comical if it wasn't such a dangerous thing to do. | Please see the response to Comment 1-1. EPA would not consider a cleanup proposal valid if it posed new or additional danger to people or the environment. |
| 3 | 1 | In my estimation the idea of dumping 700,000 cubic yards of material contaminated with pesticides, chemicals and heavy metals (which could include mercury) alongside a fast flowing river which has flooded the area several times in the past and holding it there with an earthen berm is just another example of this administration's idiotic notion of saving money at the expense of very possible environment hazards and a possible contamination of the ecological system all the way from Portland's Terminal 4 to the sea and then some. | Please see the response to Comments 1-1 and 2-8. EPA will include a public input process when developing the final screening criteria to ensure your concerns are addressed. The cost of cleanup at Terminal 4 is the responsibility of the Port of Portland, not the taxpayer funded Superfund. While the Port is primarily funded privately, it does receive about 5% or less of its' operating budget from a local tax base. |
| 3 | 2 | [Commenter describes site that cannot be used by the public for fishing, boating or swimming due to it's concentration of these heavy metals] Why do you want to present our area with the prospect of such a problem now in or in the future? This seems like another of the Bush Administration's boondoggles. Thanks but no thanks. I think you should give this considerably more thought. | Please see the response to <u>Comment 1-1</u> . The proposed action will reduce the concentrations of contaminants currently located in the river. |
| 3 | 3 | It will cost the area millions if not billions if this turns out to be a mistake and will ruin not only the downstream Willamette but also the lower reaches of the Columbia river. I think this is an obvious farce. | EPA evaluated the cleanup alternative and determined that the CDF can be designed to be safe and effective in containing the contaminated sediments from Terminal 4. |
| 3 | 4 | [This proposal will] give us tainted Salmon, Sturgeon and Smelt for just a few. | Please see the response to <u>Comment 1-1</u> . The proposed alternative will reduce the concentrations of contaminants currently located in the river, thus reducing potential exposure and toxicity to fish. |
| 4 | 1 | We are residents of the Linnton Neighborhood across the river from Terminal 4. Our family is opposed to redesigning T4 to store toxic waste. | Please see the response to <u>Comment 1-1</u> . |
| 4 | 2 | This is a dangerous proposition in our opinion and is being pursued by the City of Portland because it is the cheapest option. | This action has been proposed to EPA by the Port of Portland. Please see the response to <u>Comment 1-1</u> . The cost information presented by the Port does not indicate the CDF is significantly less expensive if no other waste is placed in the CDF or if a large portion of any additional waste comes from other Port cleanup projects. |
| 4 | 3 | Heavy rain, natural catastrophes, and poor management of the site could result in contamination escaping into our river. | Please see the responses to <u>Comments 2-6</u> and <u>2-8</u> . A long-term management plan will be required from the Port as a part of this cleanup. EPA plans to oversee the long-term monitoring and management of the CDF after it is constructed. |
| 4 | 4 | We ask you to require this material to be hauled inland to a safe | Your preference for off-site disposal has been noted. Please see the responses to <u>Comment 1-1</u> . |

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| | | location. | |
| 5 | 1 | We live on the River. WE KNOW the problem. | Thank you for your input. |
| 5 | 2 | We are currently appalled that pollution is not only not being addressed but is being added to. Nobody knows for sure that contaminants will not escape landfills or other holding storage. Slip 1 could well be the next disaster area. | <p>It should be noted that the proposed alternative will REDUCE the concentrations of contaminants currently located in the river. In evaluating the long-term effectiveness of the Removal Action, the Port and USEPA have identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the monitored natural recovery (MNR) and to verify the long-term adequacy of the performance of the sediments caps. In addition, post removal action confirmation sampling and analysis will be conducted after construction to provide direct measurement of residual concentrations. Corrective actions will be taken if caps or dredged areas fail to meet performance requirements. All of these are being required by EPA to ensure that releases from the CDF do not occur.</p> <p>Capping contaminated sediments and on-site confined disposal facilities are proven methods that have been successfully used in the Northwest to eliminate exposure to contamination. In the Commencement Bay Superfund site, three CDFs have been sited, designed and constructed under the regulatory oversight of EPA.</p> |
| 5 | 3 | Please examine the motives of those who promote burying contaminants in the River. Is it possible that they look forward to ongoing cleaning-up enterprise? I have become extremely suspicious. This is a sad and alarming state of affairs. | <p>The contaminants are not being buried in the river; rather they will be placed in an engineered confined disposal facility to isolate the material from exposure to aquatic organisms or humans. Please see the response to <u>Comment 1-1</u>.</p> <p>The cost of the proposed removal action is not significantly different from the other alternatives. EPA believes that construction of a CDF with extra capacity can provide an overall net benefit to the Portland Harbor Superfund site by providing on-site disposal that may isolate and consolidate contaminated dredged materials. Creating disposal options for the Portland Harbor Superfund site helps control the cost of disposal because it creates a more competitive market for disposal. This in turn, makes dredging and removal of contaminated sediment a more cost effective remedy and encourages the consolidation of the contaminated sediments into a limited number of locations and may reduce the area within the Willamette River where contaminated sediments would be contained in place.</p> |
| 6 | 1 | Our club is very concerned with the location of the proposed hazardous waste site at Slip 1, Terminal 4 | Please see response to <u>Comment 1-1</u> and <u>2-3</u> . |
| 6 | 2 | [Our club is very concerned with the] lack of information as far as mitigation for loss of warm water spawning habitat, water area and how the area will be handled in regard to warm water fish presence. | <p>The Biological Assessment (BA) in Appendix P of the EE/CA focused on Federally listed and proposed threatened and endangered species in accordance with requirements of the Endangered Species Act (ESA). However, other aquatic species were evaluated in terms of the sustained presence of natural habitat-forming processes in the watershed that are necessary for long-term survival of the species.</p> <p>It should be noted that the Preferred Alternative will benefit fish and wildlife in the Lower Willamette River by isolating contaminated sediments that presently pose a risk to aquatic organisms. Although the Removal Action area is highly developed for maritime commercial uses, some wildlife, including threatened and endangered fish species, other native and non-native fish species, amphibians, and other wildlife use the site to varying degrees.</p> <p>Using the <i>Matrix of Pathways and Indicators</i> (MPI), as developed by the NOAA Fisheries, six conceptual groups (e.g., water quality, habitat access, habitat elements etc.) and 18 habitat indicators (e.g., temperature, sediment, chemical contamination etc) were employed to assess the Preferred Alternative environmental effects on these other species, including warm water spawning habitats. Effects of the proposed action are classified as to whether the action will restore, maintain or degrade a particular indicator. Based on the analysis, it was identified that environmental baseline conditions are not functioning properly within the Removal Action area and that the proposed Removal Action will not degrade long-term conditions. However, it was concluded that habitat (including that of warm water species) will be destroyed through creation of the CDF for which mitigation will need to take place.</p> |

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| | | | EPA plans to mitigate habitat lost through creation of the CDF. The Preferred Alternative would result in loss of 15.3 acres of aquatic habitat in Slip 1. Temporal loss would occur when approximately 8.7 acres of cap are placed and 9.2 acres are dredged. Details of the Compensatory Mitigation Measures process can be found in Appendix Q, Section 7.2 of the EE/CA. Additionally, the Action Memorandum provided initial performance standards for required mitigation. A final mitigation plan will be developed as a requirement of the design process. |
| 6 | 3 | We are currently requesting information from both the Port of Portland and ODFW. We would appreciate a 30 day extension on public comment and perhaps changing the public meeting now scheduled for the 23 rd of June to the 30 th . Our club represents over 300 warm water anglers, most in the Portland-Metro area and our scheduled meeting is the 23 rd . This would allow us additional time to get answers from both the Port (who seems to be in a big hurry) and ODFW. Your assistance would be greatly appreciated and the people of Portland should have every opportunity to comment on this proposal. | Due to several requests for extension, EPA extended the comment period from 30 days to 90 days. |
| 6 | 4 | It has also been brought to our attention that Waste Management-NW is going to establish a site for waste management on the River adjacent to Cathedral Park and will move waste by train to Arlington. This might well be an unexplored option which would eliminate the need to place toxic waste at the Slip 1 site. | Upland disposal of dredged material was explored as an alternative in the EE/CA as Alternative D and is considered a viable alternative. However, based on a number of evaluation criteria, including factors such as less handling and transport of contaminated material and less community impacts from truck transport (which would be used regardless of disposal location), the CDF option was selected as the preferred alternative. EPA has identified a number of benefits for the CDF for the Terminal 4 cleanup and potential benefits for the harbor-wide cleanup. Please see the response to Comment 1-1 . |
| 7 | 1 | The proposal to move the mess and re-bury the material close by seems to be a non solution. Please make it a permanent solution not a cost savings measure. | Please see the response to Comment 1-1 . |
| 7 | 2 | If you run out of money contact the people who benefited from creating the mess and make them pay. | Thank you for your input. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, viable Potentially Responsible Parties pay the cost of cleanup, including EPA oversight costs. |
| 8 | 1 | Any cleanup of the toxic wastes along the 6 miles of Portland's superfund site needs to include removing the toxic materials from the river and from its shores. | EPA has noted your preference for removal of sediments. Under the proposed alternative, a significant amount of uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Lower level contamination will be capped in place. Due to the wide-spread area and depth of contaminants in the river, it is not possible to remove all of the contamination. Therefore, one of the objectives of cleanup is to minimize or eliminate any potential exposure to contaminants by aquatic organisms or humans. Also see response to Comment 1-1 . |
| 8 | 2 | So long as these wastes are left in this watery environment, we cannot feel safe from their migration to other locations. Please make this cleanup a true cleanup. The waste needs to be moved to a far safer location, or processed into a safe form. | Please see response to Comment 1-1 . |
| 9 | 1 | As a father of 3 and a local pediatrician I am very interested in a clean river! The coast is generally too cold or Hwy 26 too crowded to get to the coast on pretty days. Many local families especially with small children rely on the river beaches for sand play and beach fun. Check out sauvie island on a 75 degree or warmer day and look at the numbers of families going. | EPA agrees that actions are required to protect human health and the environment. As such, Alternative C was selected as it was identified as the most aggressive and acceptable in eliminating risk pathways. |
| 9 | 2 | Small children and pregnant moms are eating fish caught in the river. Please do everything possible to clean the river. | EPA agrees that protecting the health of pregnant women and young children is a very high priority and our actions must be sufficient to protect them as well as general human health and the environment. The cleanup of Terminal 4 is one early action being taken in Portland Harbor to reduce risks to people and fish and wildlife that use the river. The proposed Removal Action will reduce the concentrations of contaminants |

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| | | | currently in the river which pose potential toxicity and bioaccumulation concerns to fish and the people who consume them. |
| 10 | 1 | I support a clean-up of the toxic waste currently in and being dumped in the Willamette River in Portland, OR, [I support] and properly storing it in a landfill and not in the river. | Please see response to Comment 1-1 and Comment 12-1 . |
| 11 | 1 | We TRUST THIS FINDS YOU OPEN TO APPLY ALL THE AUTHORITY INVESTED IN YOUR PERSON TO MAKE EVERY WISE EFFORT TO SEE THAT THE PORTLAND HARBOR IS CLEANED UP AND MADE SAFE FOR THE CITIZENS IN THIS AREA. WE THANK YOU FOR TAKING FULL ACTION IN THIS IMPORTANT ENVIRONMENTAL ACTTIME IS OF THE ESSENCE. WE ARE PREPARED TO COME ALONG SIDE AND HELP WHERE NEEDED. | The cleanup of Terminal 4 is not being delayed and the response will be protective of human health and the environment. |
| 12 | 1 | It is beyond time for real action cleaning up the Willamette River. Get the waste out now. | Thank you for your comment. EPA agrees that action must be taken to clean up contaminated Willamette River sediments. The Terminal 4 cleanup is an early action being undertaken prior to deciding the harbor-wide cleanup plan so that risks can be reduced sooner. However, time must be spent developing cleanup plans so they are technically and scientifically sound, comply with laws and regulations and the public is provided the opportunity to participate in the process. Another important objective for early cleanups like Terminal 4 is that they facilitate the larger Portland Harbor cleanup. EPA believes the selected Terminal 4 cleanup meets this objective. |
| 13 | 1 | I agree with Oregon Center for Environmental Health that the Portland Harbor cleanup should be as complete as possible. The toxic wastes should be removed to a toxic waste disposal site, not left in the river. | EPA has noted your preference for off-site disposal of sediments. Please also see response to Comment 1-1 . |
| 14 | 1 | The six mile stretch of the Portland Harbor has a history of over 100 years of industrial waste disposal practices. Now is the time to solve this problem! | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. |
| 14 | 2 | PLEASE GET THE TOXICS OUT OF THE HARBOR AND INTO A PROPERLY PERMITTED LANDFILL WHERE THEY BELONG! | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 15 | 1 | Protection Agency my ass. | Comment noted. |
| 15 | 2 | When you leave hazardous sediments in the water you are not protecting anyone. Don't just move it around. Remove it! | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 16 | 1 | I am in support of the harbor cleanup. | Please see the response to Comment 12-1 . |
| 16 | 2 | While this may be the least expensive alternative for the Port, it certainly is not the best choice for the community now or for future generations. | The cost information presented in the EECA does not indicate that the CDF is significantly less expensive if no other waste is placed in the CDF or if a large portion of any additional waste comes from other Port cleanup projects. |
| 16 | 3 | There are simply too many possible catastrophic scenarios to make this under water storage acceptable. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see responses to Golder comments and Comments 2-6 and 2-8 . |
| 16 | 4 | The toxic wastes shouldn't be allowed into the river to begin with, but, to agree to this inadequate attempt of resolution would be a dereliction of duty. | Thank you for your input. Please see the response to Comment 1-1 . |
| 16 | 5 | [I am in] in total disagreement regarding the Port's plan to "store" these contaminates under water. Please continue to press for these cleanups and the proper disposal of any toxic material from our rivers! Storing toxic material in the river is NOT an acceptable plan. | EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 . |
| 17 | 1 | We are writing to express my concern for the plan to store toxic waste in the terminal slip at Port of Portland in the Willamette River. Further delaying REAL cleanup of the Willamette River is not a solution. | Please see the response to Comment 12-1 . |

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| 17 | 3 | As concerned citizens we ask that the EPA to totally remove toxic substances from our waters and dispose of them in a permanent manner. Do this for the betterment of our existing community and generations to come. | EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 . |
| 18 | 1 | I am writing to add my voice to the many concerned Portland citizens who are calling on the EPA to permanently dispose of the toxins the Portland Harbor Superfund site. A temporary storage in another part of the river is not acceptable. Please clean up our river for good! | Please see the response to Comment 1-1 . |
| 19 | 1 | I strongly oppose any temporary, Band-Aid measure to address the Superfund site at the Portland Harbor and Willamette River. This issue has been carrying on for far too long. This letter requests a safe cleanup strategy that permanently removes the toxins from the harbor and river. | Please see the response to Comment 12-1 . Each of the alternatives analyzed in the EE/CA offer a viable permanent cleanup option for contaminated sediments. However, when the studies on the entire Portland Harbor site is completed, the Port may need to do more work if it is determined to be needed. |
| 19 | 2 | [T]he liable parties need to be held accountable to addressing this toxic situation. | Thank you for your input. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. |
| 20 | 1 | In today's Oregonian, I was pleased to read that the EPA was going to require NW Natural to finally clean up the tar body. I would hope that your record of expediting Superfund sites would prevail here. Please take the momentum created by the cleanup of the tar body, and get our Willamette River back to the asset that drew the first people to come to Oregon. | Thank you for your comment. The cleanup at GASCO is not part of this current proposal, and has already been completed. |
| 20 | 2 | Then there was a full page ad about a Thursday hearing on the overall treatment of Superfund wastes in the harbor. The recommendation to disturb and remove the variety of hazardous materials, then place them in another water containment area still in the harbor was unbelievable. In this proposal there are multiple risks: probable leakage during removal; need for multiple ways to store the variety of toxins and placing them in basically the river again to eventually leach and leak. If they are to be removed, then just remove them to a permanent, nonriver waste center. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 21 | 1 | I have had difficulty getting information about the Portland Harbor Superfund site from the EPA website. However, what I understand is that the cleanup of the Portland Harbor is currently being considered by the EPA. | EPA checked our website in response to your comment to make sure that documents were easily accessible. |
| 21 | 2 | I am concerned that toxins will not be fully removed from the water, but will simply be covered up or stored in an abandoned terminal slip. This is unacceptable. We need to fully remove toxins now and contain them in a manner that future generations will not have to deal with. My neighbors and I will be watching this issue closely. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 21 | 3 | Please develop a plan that gets rid of hazardous and cancer causing agents in our waterways. | EPA agrees that actions are required to protect human health and the environment. Please see the response to Comment 2-3 . |
| 22 | 1 | GET THE WASTE OUT OF THE RIVER | Please see the response to Comment 12-1 . |
| 23 | 1 | I am a Portland resident. Please pursue the safest cleanup strategy possible for the Portland Harbor. | EPA agrees that actions are required to protect human health and the environment. Please see the response to Comment 2-3 . |
| 23 | 2 | Seriously consider removing toxic substances from the harbor bottom and dispose of them permanently where they will not threaten people and wildlife. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |

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| 23 | 3 | Long run benefits make this short term sacrifice worthwhile. If this is not within your budget, please make it known more tax money is needed for this important objective. | The Port of Portland, who is the potentially responsible party for the Terminal 4 cleanup is bearing the cost of the cleanup. It does not involve an expenditure of the taxpayer funded Superfund. While the Port is primarily funded privately, it does receive about 5% or less of its' operating budget from a local tax base. Please see response to Comment 4-2 . |
| 24 | 1 | It is extremely important that the toxic substances are removed from the river bottom and stored in a permanent properly permitted landfill. Please do it right. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 25 | 1 | To the Oregon Center for Environmental Health Dear Sirs, After reading your ad in the Oregonian, I wish to state my support for removing the hazardous material from what should be a beautiful river and a Safer river too. Permanently—for a Clean river. Hope you get a Big response like mine. | The proposed cleanup will be done by the Port under EPA oversight. Each of the alternatives analyzed in the EE/CA offer a viable permanent cleanup option for contaminated sediments. Please see the responses to Comment 12-1 and Comment 19-1 . |
| 26 | 1 | Please don't keep the waste IN the Columbia!! Please dispose of it in a safe permanent containment area, away from the river!! | The Terminal 4 Cleanup does not address contaminated sediment in the Columbia River, but it will contribute to cleaning up the Willamette River. EPA has noted your preference for offsite disposal. Please see response to Comment 12-1 . |
| 27 | 1 | I want to acknowledge the EPA for the commendable work you have done and are doing for the environment. | Thank you for your input. |
| 27 | 2 | I understand the intent but urge you to use the precautionary principle for the Terminal 4 cleanup and support the landfill option over filling in slip #1. | Please see response to Comments 1-1 and 12-1 . |
| 27 | 3 | As a resident of Linnton and the Environmental Chair of the Linnton Neighborhood Association, I was initially hopeful when I heard that there would be early action to clean up the Willamette River. This was followed by shock to find out that the preferred "action" by the Port of Portland and the EPA is to build a toxic dump in the river and only 400 yards from our Historic Town of Linnton. | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 . |
| 27 | 4 | Far from being an "isolated area", we are a town with a proud history predating that of Portland. Indeed, we were a thriving town before the highway was widened in the 50's, obliterating half our businesses. Now we are a neighborhood of several hundred homes and more than a dozen businesses that look directly at the slip you plan to transform into a 15 acre toxic dump. My own doorstep is approximately 550 yards from the site in question. The Linnton Neighborhood Association has several serious concerns with this plan. | Please see response to Comment 2-2 and 12-1 . |
| 27 | 5 | It destroys any hopes we have for a vibrant waterfront in Linnton. The Portland Bureau of Planning, as a result of a recommendation by River Renaissance, convened a planning group a year ago, consisting of neighbors, businesses, industry, and other stakeholders (including the Port of Portland) in order to consider the design of a mixed-use village in Linnton. Having a toxic dump 400 yards away will essentially dash any hopes of any investor wanting to participate in the development of our town. In addition, no parents would want their children to play in the proposed park or on the beach just hundreds of yards from this toxic dump. This is personal. Would you want this toxic waste dump 400 yards from your home? | Action is being taken at Terminal 4 because there are uncontrolled hazardous substances posing risks to people and the environment. It is incorrect to equate a CDF to a toxic waste dump. Please see the response to Comment 1-1 and Comment 2-3 . |
| 27 | 6 | A 15 acre toxic dump adjacent to the river makes no sense environmentally. It is well known that even landfills on dry land will leach eventually, even if state of the art lining materials are used. | Suitability criteria will be developed with public participation for the contaminated sediment selected for placement in the CDF. Please see the response to Comments 1-1 and 12-1 . |

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| | | Why in the world would we want one in the river? | |
| 27 | 7 | This site is a flood zone and there are three earthquake faults in this area. What precedent are we setting in a city known for its environmental leadership? | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of alternatives. Please see response to Comments 2-6 and 2-8 . |
| 27 | 8 | It makes no sense economically. Any savings of burying the waste in the river will be more than offset by the economic disaster to the values of our homes and businesses of having a toxic waste dump 400 yards from our riverfront. | All alternatives analyzed in the EE/CA benefit the community by reducing the risk of exposure to contaminated sediment. The Removal Action will include burying the wastes in the river, but rather will be placing contaminated sediment within a carefully designed CDF. Also see responses to Comment 1-1 and Comment 2-3 . |
| 27 | 9 | During our [Linnton] planning process, we were told repeatedly that this whole stretch of the river is "industrial sanctuary". This was used as an argument against developing our village. Why does it now make sense to take a 15 acre slip out of commission when our opponents have seen our 40 acre site as precious industrial land and have therefore opposed our dream of a village by the river? | Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations. |
| 27 | 10 | The EPA and the Port of Portland have been champions in the field of Sustainability. EPA grants have funded amazing projects. The Port of Portland has done wonderful work, i.e., eliminating toxic chemicals and composting food waste at the airport. | Thank you for your input. |
| 27 | 11 | Creating a toxic dump in the Willamette River and calling it "cleaning up the river" will be seen by both friend and foe as a cynical move driven by money. | Cost was not a significant factor between the alternatives. Also see response to Comment 5-3 . All of the alternatives carried forward for evaluation (Alternatives A, B, C, and D) are protective of human health and the environment. Please see response to Comment 1-1 . |
| 27 | 12 | Please do not destroy our hope of a truly clean Willamette River – for all generations to come, by claiming that a toxic dump built in a slip is the best solution for our beautiful river, for our town, and for our kids. Many Linnton residents once played on our Linnton beach, swam in the Willamette River, and played in the Linnton Park when they were children. None of this has been possible for many years. We in Linnton dream that once again there will be children swimming in a pristine Willamette River, and playing on Linnton's unique and beautiful sandy beach and picnicking in a park that is safe, clean and accessible. | The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Please see response to Comments 1-1 and 2-3 . |
| 27 | 13 | Please lead the way by cleaning up the river the right way, by disposing of this waste inland. Our grandchildren and great-grandchildren and all future generations of all species deserve nothing less. | Please see response to Comments 1-1 and 12-1 . |
| 28 | 1 | Willamette Riverkeeper has reviewed the major portions of the EECA for T4 and offers the following comments. We have multiple questions about the cleanup of Slip 3, and the creation of a Confined Disposal Facility (CDF) at Slip 1. While we have questions and concerns, we do believe that there is the potential for this action to lead to a better overall cleanup of contaminated sediments from throughout the Portland Harbor area of the Willamette River. | Thank you for your input. The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. |
| 28 | 2 | Some have expressed concerns about the long-term impact of a CDF in regard to ecological and human health. While some questions need to be answered, it seems to us there will be multiple opportunities for community members to have input on the design and implementation of any such facility, if approved. It seems that there is an opportunity to address issues related to a CDF's long-term relationship to the Willamette River's ecology, and human health. | EPA agrees that actions are required to protect human health and the environment and encouraged public comment and input for this project. As a result of public comments, some additional design considerations will be required by EPA. These are outlined in the Action Memo and include geotechnical considerations, monitored natural recovery contingencies, sediment disposal criteria (which will have a separate public input process), and compensatory mitigation. |

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| 28 | 3 | As with any large and complicated project, we believe that community involvement is critical. We believe that this kind of participation should be continued into the design of any future CDF, and into the Waste Acceptance Criteria that must be developed that will determine the level of contaminated sediment that will be allowed into the facility. | EPA agrees that community involvement is essential to making good decisions and we will continue to seek and encourage public involvement. In response to community concerns, EPA will solicit public input when developing the screening criteria to ensure your concerns are addressed. |
| 28 | 4 | In researching active CDF sites, we have learned that they can indeed work. We've learned from the folks at Citizen's for a Healthy Bay, in Tacoma, a group that works on Commencement Bay, that these sites have worked for them with contaminated sediment that is very similar to what we know resides in Portland Harbor. Further, Citizen's for a Healthy Bay have monitored their sites for years. For example, at their Milwaukee Waterway site, after 13 years of monitoring, there has been absolutely no change at the site whatsoever. They have three such sites in Commencement Bay. | Commencement Bay is an example of where a CDF has proven successful in the Pacific Northwest. A CDF must be engineered for the specifics of the site, such as for fresh water as opposed to salt water, and long term monitoring must be a part of the plan. |
| 28 | 5 | For Portland Harbor we must ask the question, "what will lead to the best, cleanest, and most comprehensive cleanup of the Willamette River in this area?" It would seem if we provide a nearby, scientifically sound, ecologically sound option for "some" types of contaminated sediment, that we will enable more PRPs to do the right thing – and get their dirty sediment out of the Willamette River. | The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. EPA agrees that actions are required to protect human health and the environment. As noted within <u>Comment 2-3</u> , the proposed action, Alternative C, will reduce exposure of humans and ecological receptors to site contaminants. In addition, the CDF has excess capacity for disposal of an additional 560,000 cubic yards of contaminated sediment from other cleanups in the harbor if it is decided that the material is suitable. Also see response to <u>Comment 12-1</u> . |
| 28 | 6 | If we fail to do this, we may well have a harbor that has dozens of Capped sites. Instead of monitoring one main facility, in the case of a CDF, we may be relegated to monitoring dozens of sites in a dynamic river environment. With dozens of sites, there would be an equal number of PRPs responsible for monitoring their individual sites. This does little to quell worries about long-term risk. | Consolidating sediments in a CDF could reduce the number of capped sites requiring monitoring. An on-site CDF should encourage the Port of Portland to take more early actions to remove more contaminated sediments from the river. The proposed Removal Action for this Early Action will provide a reduction in risks from contaminated sediment at Terminal 4 and may provide options for disposal of dredged materials from the larger cleanup of the Portland Harbor. Please see response to <u>Comment 1-1</u> . |
| 28 | 7 | If we limit the cleanup of sites to dredging and landfill disposal, such as Arlington, we may well end up with companies fighting the cost of such cleanup, with the river remaining in a polluted state for decades after, and a slough of litigation occurring. | EPA agrees that actions are required to protect human health and the environment and are committed to pursue the path set forth in the Non-Time Critical Removal Action (NTCRA). |
| 28 | 8 | Willamette Riverkeeper has worked on this project for years, and have been the leading vocal advocate for getting the river cleanup up in a timely and comprehensive manner. We need to ensure that human and ecological health is addressed in this cleanup. If our concerns about the CDFs engineering and waste disposal criteria are addressed, we may well have another viable option that will lead us to cleaning up the Willamette River for the betterment of river wildlife, and people. | As a result of public comments, some additional design considerations will be required by EPA. These are outlined in the Action Memorandum and include geotechnical considerations, monitored natural recovery contingencies, sediment disposal criteria (which will have a separate public input process), and compensatory mitigation. Please see the response to <u>Comment 1-1</u> . |
| 28 | 9 | While the document is clearly laid out, and follows the general guidance for an EECA, there are some claims that are made that don't seem to be clearly substantiated or sufficiently discussed. | Thank you for your input. The analysis conducted was similar or exceeded that of similar EE/CAs, and was consistent with the Non-Time Critical Removal Action (NTCRA) guidance document. For specific responses to comments, please see responses below. |
| 28 | 10 | The first Removal Action Objective listed on page 2 of the Executive Summary is to "reduce ecological and human health risks associated with sediment contamination with the Removal Action area to acceptable levels." Analytical data were compared only to PECs and TECs which are screening values used for ecological risk. | The TECs/PECs were the only concentration-based benchmarks that were available that matched the scale of potential exposure at the site. These values are typically used to evaluate the potential toxicity of sediments where no data on biological effects are available (e.g., toxicity test results or community characterization). |
| 28 | 11 | <i>Note: this comment merged with 28-10 above.</i> | |
| 28 | 12 | Sediment samples were divided into surface sediments (0 – 1 foot) and subsurface sediments (> 1 ft). The biologically active zone for | The 0-1 foot depth interval was identified in the EE/CA Work Plan (Section 7.8.2), which was approved by EPA. This depth interval is consistent with the depth interval used to represent surface sediments in the |

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| | | benthic organisms is generally considered to be 0 – 0.5 ft. However, all samples were screened against the benthic PEC/TEC criteria (or they appear to have been) | Harbor-wide RI/FS. The Port and EPA team agreed to be consistent with Harbor-wide investigations where appropriate. Justification for the depth interval in the Harbor-wide RI/FS was based on (1) Sediment Profile Imaging results which showed sediment organisms deeper than 6 inches below mudline and (2) based on bathymetry results, over 90% of sediments in the 0-1 foot depth interval were stable over 2 years. |
| 28 | 13 | No screening criteria were used for human health receptors although they were identified in the conceptual site model development. We continue to talk about human health, and yet we don't have a baseline and cannot demonstrate what it is going to be. We are using criteria for ecological risk, yet not for human health | Exceedance of existing risk-based criteria for either ecological or human receptors, although not site-specific, can be enough to justify a removal action. Terminal 4 is within the scope of the Portland Harbor RI/FS which will include a comprehensive human health risk assessment due to direct and indirect (i.e., food web) exposures. The Harbor-wide RI/FS will result in risk-based sediment cleanup criteria based on the baseline risk assessments. To ensure the Terminal 4 cleanup is protective of human health and the environment, Terminal 4 will be reviewed and compared to the harbor-wide risk assessments and final cleanup criteria. Sediments in the portions of the Removal Action Area that are dredged, and those that are designated for Monitored Natural Recovery (MNR) will be monitored to determine whether conditions are consistent with cleanup criteria developed from the Harbor-wide process. If not, then additional action may be required. |
| 28 | 14 | No estimate of current risk, residual risk or risk reduction is presented in the document for either ecological or human health receptors although claims are made that "the goal of the Terminal EE/CA Report was to develop conceptual designs for removal actions that reduce risk, and provide a comparative evaluation of the alternatives." This implies that there is some baseline risk or hazard measurement or index. | No baseline risk assessment is necessary to determine that risk is reduced significantly by the proposed removal action. Capping and the CDF reduce risk by blocking exposure to bed sediments and concentrations of contaminants in the dredged areas are substantially reduced. Baseline human health and ecological risk assessments were not completed for the EE/CA because these studies are being conducted as part of the Harbor-wide RI/FS and will yield risk-based cleanup goals that can be applied to the Terminal 4 site to determine whether residual risk is acceptable. |
| 28 | 15 | While estimated volumes of dredged material are presented in the document, we were unable to find clear information on proposed dredging depths and the rationale used for those decisions | Preliminary dredge prisms were developed for the purpose of estimating the cost and feasibility of alternatives in the EE/CA. See Appendix E of the EE/CA for details. Dredge depths were selected based on one half of the PEC (probable effects concentration) and positive results of toxicity tests performed for the Slip 3 RI/FS. In some cases, areas that do not exceed PECs are included in dredge or capped areas due to engineering constraints. |
| 28 | 16 | Page 2-3. A soil unit consisting of dark grey, loose to medium dense soil...encountered below the fill in upland explorations and below surficial sediments in in-water explorations was described as a combination of fairly low density and small fines which make the saturated portions of the sand potentially prone to liquefaction during strong seismic shaking. If surface sediments are being dredged, and this type of soil unit is uncovered, how does this affect the stability of the CDF and especially the berm? I did not see this issue addressed anywhere in the report. | The issue of the liquefaction potential of soft, saturated sediments is addressed in Appendix K of the EE/CA, which presents the stability assessment of the proposed CDF berm for various loading scenarios. |
| 28 | 17 | Page 2-4 Section 2.2.5. While the RAOs specifically delineate protection of human and ecological receptors, it appears that PECs and TECs are the only screening criteria being used. How will protection of human health be addressed? How will you know if you met that goal? | Please see response to Comments 28-14 and 28-15 above. |
| 28 | 18 | Page 2-4 Section 2.2.5. Generally speaking, PECs have been used on a number of DEQ sites. Where there are exceedances of screening level criteria, most of them appear to exceed only the most conservative TEC values. If the LWRG does not develop criteria for sediment before this removal action takes place, what clean-up numbers will you use, how will they be developed, who will review and approve them, and what will you use to ensure that human health is protected | The Removal Action Alternatives were developed based on the nature and extent of contamination, guided primarily by exceedance of PECs and positive results of toxicity tests performed for the Slip 3 State-lead RI/FS. In some cases, areas that do not exceed PECs are included in dredge or capped areas due to engineering constraints. Identification of cleanup goals is one of the main objectives of the Harbor-wide RI/FS. These goals will be available for assessing the dredged and MNR areas in the Removal Action Area. |
| 28 | 19 | Page 4-1 Section 4.2.1. This section states that human health risks will be reduced through the reduction of contact between receptors | Please see response to Comments 28-14 , 28-15 and 28-18 . |

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| | | and COPCs. And that this reduction will reduce local health risks to acceptable levels. What are the levels now, how far are they from acceptable, how much will they be reduced and on what basis is the claim made that it will be acceptable. Looking at the data in Appendix H, there are some areas where higher concentrations, exceeding both PECs and TECs are found only at depth and not in surficial soils, or even soils as deep as 3 – 5 feet. | |
| 28 | 20 | Section 7. The Chemical Characteristics subsections of Section 7 describe the contaminated sediments in each of the areas to be remediated. It appears that only the ecological screening values of PECs and TECs are being used and that although there are samples that exceed the very conservative TECs, exceedances of the PECs is limited to only some sections. For instance it appears that in Berth 401, Slip 1 and Wheeler Bay concentrations of contaminants in sediments are between the TEC and the PEC values. | Please see response to Comment 28-18 . |
| 28 | 21 | Page 8-1. The subcriteria listed includes protection of human health. What is the risk to human health, how much will it be reduced? | Please see response to Comment 28-14 . |
| 28 | 22 | Section 8. It is unclear in review this section, how volumes were estimated, the depths for dredging and the criteria for developing the proposed depths. | See response to Comment 28-15 . |
| 28 | 23 | Appendix E. It appears that the only screening criteria used are for PECs and TECs. Although the biologically active sediment unit is considered to be 0 – 6 ft, these screening criteria are used at depth. There are few exceedances, mostly of PAHs and metals of both the PECs and TECs. There appears to be no evaluation of the screening criteria, its appropriateness, and any subsequent use of the information within the document. | The screening criteria are used at depth to assess the potential risk from sediments that may be uncovered during dredging. This information was used to help determine the depth of dredging needed, especially in Slip 3. Please also see response to Comment 28-18 . |
| 28 | 24 | Appendix M, Page M-2. "The condition of the ecological habitat in the Removal Area has not been formally assessed." How then will the effectiveness of any removal action be assessed? A baseline should be established. | The reference to "baseline ecological condition" refers to a formal characterization of ecological habitat, not specifically ecological risk. The potential risk analysis was conducted using the conservative assumption that habitat throughout the in-water areas is potentially habitable by aquatic organisms. This conservative approach is consistent with EPA guidance for NTCRA's and direction from the EPA/DEQ risk assessment team. |
| 28 | 25 | Appendix M Page M-4. Although human receptors are identified in the conceptual site model, I do not see where potential risks to these receptors are qualitatively or quantitatively addressed, except to say that risks will be "significantly reduced". | Please see response to Comments 28-14 and 28-15 . |
| 28 | 26 | The section on CDF recontamination is blank. Why is this? | The recontamination analysis is a work in progress which will not be completed until just prior to the initiation of cleanup. The recontamination analysis will include data collected during the Spring 2005 to obtain wet weather sediment trap and stormwater data. Because of unusually dry conditions during the 2004 field season, data representative of wet conditions were not available. An additional round of field activities was performed in Spring 2005 to obtain data representative of wet weather conditions. The recontamination analysis is a way for the Port to assess the post-removal action conditions to help ensure that the Port will only have to clean up the removal action area once. The AOC allows the Port to conduct this recontamination analysis at the time of the EE/CA, again during design, and finally prior to implementation of the remedy. |
| 28 | 27 | What is the likelihood that the overall Portland Harbor Cleanup will result in increased use of Sediment Caps if there is not a nearby facility that can receive some contaminated sediment? Does it not | EPA believes that construction of the CDF, while addressing the human health and environmental concerns of sediments within Terminal 4, also has the added benefit of creating an additional option for disposal of sediments from the harbor-wide cleanup that would not otherwise exist. Please see the |

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| | | stand to reason that without a nearby facility, we will end up with a greater degree of capping utilized at the dozens of areas being cleaned up over the next few years? | response to Comment 1-1 and Comment 28-6 . |
| 28 | 28 | Is it true that most sites with caps covering a contaminated site result in a significant amount of monitoring over a long period? | Long-term monitoring is required when hazardous substances are confined in place, including capped areas. Long-term monitoring will also be required for the CDF and the MNR areas proposed for the Removal Action Area. Appendix L of the EE/CA describes potential Removal Action monitoring and the Action Memorandum also adds additional performance standards for the MNR areas. Please see the response to Comment 28-6 . |
| 28 | 29 | Does it stand to reason that a nearby site that can aid a Superfund Cleanup will aid in getting more PRPs to the table when the Record of Decision is finalized? | The decision to construct a CDF at Terminal 4 is based on protecting human health and the environmental at the site, but there may be a potential added incentive to promote dredging in other areas of the Harbor, since the CDF has excess capacity for dredged materials. The effect of getting more PRPs involved is not certain, is not guaranteed by EPA, and is not the primary factor in selecting the preferred alternative. |
| 28 | 30 | What are the known failure rates of CDFs of a similar size and likely contaminant concentration to the proposed Slip 1 CDF? | In EPA's review of available information, we did not find any reported failures or difficulties from CDF. However, careful engineering, construction and monitoring are needed to ensure a CDF will function properly. |
| 28 | 31 | What are issues of concern that have developed at individual CDF sites across the United States? | EPA's evaluation of potential CDF use included review of technical, scientific and engineering knowledge, regulatory matters as well as the past experience on public comments gathered on previously completed CDF projects. The evaluation of the CDF reflects the current practice of CDF design and construction. CDFs are likely to be affected by local conditions and should be designed on a site-specific basis. Also see responses to Comments 2-3 , 2-6 , and 2-8 . |
| 28 | 32 | Are these being used in the Northwest, and what difficulties have been encountered? | CDFs and other in-water confined disposal facilities have been successfully used at the Commencement Bay Superfund site. Based on available information, all CDFs in the Pacific Northwest function as intended. |
| 28 | 33 | Could a CDF that could accept certain levels of contaminated sediment increase the rate of cleanup in Portland Harbor? | An on-site disposal facility will increase the options for consideration by sediment site managers as they develop clean up alternatives for other locations within the Portland Harbor Superfund Site. See response to Comment 1-1 . |
| 28 | 34 | What sources of clean fill will be utilized to construct the berm? | The identification and selection of appropriate borrow material sources will be completed during the design and construction of the CDF. In general terms, material sources providing clean, inert, granular fill materials will be considered. These may come from a variety of sources, but could include material from other Port properties or materials supplied by commercial vendors. |
| 28 | 35 | <p>Willamette Riverkeeper also believes that the Port of Portland, for the privilege of utilizing this site for a CDF, and gaining the use of lands that belong to the Department of State Lands, should:</p> <ol style="list-style-type: none"> 1) Provide a riparian restoration project at the CDF site, and 2) Provide a significant restoration site in the lower 10 miles of the Willamette River, or other nearby waterways within the Portland Metro area. <p>We believe that the proposed restoration projects will help ensure that the CDF not only helps clean up the Portland Harbor, but that the Port of Portland will also continue its tradition of value-added restoration work that is beneficial to the people of the Portland area and beyond. Such projects should complement, but not take the place of, any obligations the Port of Portland has under the Natural Resource Damages aspect of the Portland Harbor project.</p> | <p>EPA requires the Port to develop a mitigation plan in compliance with the Clean Water Act Section 404(b)(1). The analysis is presented in Appendix Q, which analyzes potential requirements of the 404(b)(1) process and includes a plan and schedule for developing a mitigation plan during the design phases of the Removal Action. Mitigation projects required by this removal action are needed to mitigate for unavoidable impacts resulting from the Terminal 4 action and will not be compensation for damages to natural resources caused by the release of hazardous substances from the Terminal 4 facility. The Natural Resource Trustees, including state, federal, and Tribal Governments, are assessing damages to natural resources from releases to the river and will negotiate appropriate settlements for such damages in the future. See the Action Memorandum, Section 6, for more detailed mitigation performance requirements outlined by EPA. Significant requirements are summarized below:</p> <p>Compensatory mitigation plans will be developed pursuant to performance criteria and in consultation with EPA and resource agencies, and be submitted to and approved by EPA during the Removal Action Design. General criteria EPA required to address Lower Willamette River watershed issues include:</p> <ol style="list-style-type: none"> 1) All compensatory mitigation must be consistent to the maximum extent practicable with any established mitigation strategies or conservation initiatives supported by state and federal resource agencies for the Lower Willamette River basin. 2) Preference will be given to compensatory mitigation plans that are consistent with habitat function. 3) All compensatory mitigation plans will include an assessment of how they contribute toward the |

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| | | | <p>conservation and recovery of ESA listed species.</p> <p>4) Mitigation plans must include consideration for connectivity to existing habitat.</p> <p>5) The potential success of the mitigation projects will be specifically factored into habitat plans.</p> <p>6) All compensatory mitigation plans will include measurable performance objectives, management, monitoring and reporting requirements, responsibilities, and schedules.</p> <p>7) Native species only will be utilized in any plantings to the maximum extent practicable.</p> <p>8) Mitigation plans should include facility design and site plans for any development/redevelopment that occurs as a result of a fill. The facility and site plans must ensure that the facility and site characteristics and functions do not create adverse impacts to water, sediment, and habitat quality during construction and operation.</p> |
| 29 | 1 | I downloaded the PH T4SOW092503.pdf but found it an awful lot to swallow. I am not a scientist but I am very much for cleaning up our Willamette River. | Thank you for your input. |
| 29 | 2 | While our current society appears to be so wrapped up in attaining/maintaining affluence, taking care of our Willamette will actually veer us off that path and hopefully have us all involved in creating a healthy river and a legacy. | Thank you for your input. Please see the response to Comment 12-1 . |
| 29 | 3 | While no cleanup is even close to cheap or painless I feel we should keep in mind that it is not today's cost that should steer our thinking but the idea of a clean river that flows into the Columbia and then to the ocean for all. The thought of more recreation, pride and respect for what flows through our city. | One of the primary evaluation factors is the effectiveness of the removal action to reduce risks to human health and the environment. The implementability and cost of the removal action are also factors for consideration, but cost cannot outweigh the requirement to protect the environment. |
| 29 | 4 | We are not as ignorant as we were in the past. We need to respect what we have and care for it. Please help us clean up our river the right way and make us proud. | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. |
| 30 | 1 | I am trying to follow and understand the analyses and options, but I still don't understand why getting the toxic material out of the river and stored in as best a landfill as we might have is not the way you are pushing for. | Please see response to Comment 1-1 . Additionally, off-site transport of large volumes of dredged material also has impacts on the environment and the community as were discussed in the EECA. |
| 30 | 2 | Why would it be good to store in the river? | The dredged sediment will not be stored in the river, but rather placed in a carefully designed disposal facility at Terminal 4. Please see response to Comment 1-1 . |
| 30 | 3 | Wouldn't that [a CDF] be harder to monitor over the years to come? | Long-term monitoring will be a condition of design and required by EPA. Monitoring a CDF, while different than monitoring upland disposal sites, has the same set of objectives and challenges than upland disposal. Also see response to Comment 28-6 . |
| 31 | 1 | I am writing to express my opposition to any plan to store recovered toxic waste anywhere it can be reached by one of the Willamette's recurring floods. Thank you. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 and Comment 2-8 . |
| 32 | 1 | I am writing to let you know of my concern for the welfare of the Willamette River. I want the EPA to get the toxics out of the harbor and into a properly permitted landfill where it belongs! | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 33 | 1 | I want you to know that the EPA must get the toxics out of the harbor and into a properly permitted landfill where it belongs. The future health of our beautiful river must be maintained. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 34 | 1 | After reading a recent article in the Portland "Oregonian" about plans for disposal of toxic waste materials at Terminal Four in the Portland harbor, I am stunned and angry. I am appalled at the plan to create a dump site in slip Number One right next to the river. Historically, these supposedly "safe" sites have proven to be otherwise. | Please see response to Comment 1-1 and Comment 2-3 . |
| 34 | 2 | It is obvious that the Port and the EPA are looking for a convenient | Construction of the CDF will effectively confine contaminated sediment from Terminal 4. The excess |

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| | | hole to deposit not only toxic waste from Terminal Four, but also contaminated materials from outside the terminal. | capacity may facilitate cleanup of Portland Harbor, but whether additional dredged sediment may be placed in the CDF will need to be made future cleanup decisions. |
| 34 | 3 | This plan may be viewed as a cost saving plan, but a plan should be adopted that is the safest over the long range | EPA's evaluation of the preferred alternative has determined that the CDF can be designed to be safe and effective in the long-term. |
| 34 | 4 | I am requesting that you develop a better plan which will remove the toxic waste AWAY from the river. | Your preference for off-site disposal of sediment was noted. EPA analyzed five alternatives that cover the range of options available to protect people and wildlife from contamination. Please see the response to Comment 1-1 . |
| 35 | 1 | We support cleanup of toxic materials from the Portland, Oregon, Harbor. | Thank you for your input. Please see the response to Comment 12-1 . |
| 35 | 2 | [We] do not agree that the toxic waste should merely be relocated to a terminal slip at the Port of Portland. We feel that these dangerous materials should be completely removed from the river and put into a secure landfill. We urge you to support this alternative. | EPA has noted your preference for off-site disposal of sediments. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 36 | 1 | I am writing to ask the EPA to move start the cleanup of the harbor at Portland, Oregon. We need to remove hazardous sediments from part of the Portland Harbor including pesticides, mercury, PCB's and dioxins. | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. Please see the response to Comment 2-3 . |
| 36 | 2 | We must not store them in-water in an abandoned terminal slip at the Port of Portland. | EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 . |
| 36 | 3 | It is unfortunate that so many toxins were discharged into our river. At this time, we need a real cleanup that safely removes the toxins so that they can't leak | Please see the response to Comment 2-3 . |
| 36 | 4 | [we need a real cleanup that safely removes the toxins so that they can't] be disturbed or dislodged by a severe flood. We already know that a flood plain is not a suitable site for storage of toxic materials of any kind. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-6 and 2-8 . |
| 36 | 5 | It is important to work toward the safest cleanup strategy possible. Please remove this toxic waste and dispose of it permanently elsewhere in a properly permitted landfill where it belongs. Thank you. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 37 | 1 | I can't believe that things are allowed to get this out of hand. Getting to the point where the solution is compromised by finances mean that someone messed up earlier. | Thank you for your input. The preferred alternative was determined to be the most protective and cost was not a significant factor between alternatives. |
| 37 | 2 | Whoever is responsible for the contamination should be held accountable, otherwise it will be the tax payers and future generations who will pay the price. | Thank you for your input. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is responsible for paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. |
| 37 | 3 | Concentrating contamination near a hugely powerful and dynamic system like the Willamette River, not far from an earthquake fault, is just asking for problems later. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that rigorous examination of flooding, earthquakes and other catastrophic event was part of the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 . |
| 37 | 4 | Let's really use the Precautionary Principle rather than just giving it lip service while we really concern ourselves with money. Moving the contamination from the river bottom to the bottom of the slip at Terminal 4 right next to the river is an irresponsible way of sweeping it under the rug for someone else to deal with at a later time. It will cost even more money to deal with later. Let's do it right. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 and 2-3 . |
| 38 | 1 | As a concerned citizen and resident of the Portland metropolitan area, I oppose the Port of Portland proposal to clean up the waste at Terminal 4 because it creates a hazardous waste disposal site in the | Only contaminated sediment with relatively low level concentrations or non-leachable contaminants will be allowed in the CDF. EPA intends to seek additional public input on the final sediment quality criteria for the CDF during the design phase of the project. Under the proposed alternative, uncontrolled pollution that |

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| | | very river that everyone wants to clean up. | poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 38 | 2 | I do support dredging these contaminated sediments and shipping them by rail to an appropriate land fill in eastern Oregon. I believe getting toxic material out of the river is the safest, long-term cleanup strategy instead of simply burying it in the river. I urge you to please consider the wisdom of a long-term cleanup strategy for future Oregonians. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 39 | 1 | I couldn't believe it when I saw the information in the Oregonian Wednesday, June 22 nd regarding the Portland Harbor clean up plan. Moving toxic substances from the harbor, and then storing them in an abandoned terminal slip at the Port of Portland is not a healthy alternative. These toxins need to be removed from the water completely and disposed of in a permanent location other than the river. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 39 | 2 | Please don't go about this clean up in a half hearted manner. Use the funds given to do the job properly. | The EE/CA provided a very thorough analysis of the problem and potential alternatives. EPA believes the selected decision is the best use of resources to get the cleanup done, protect human health and the environment, and provide additional options for the Harbor-wide cleanup. |
| 40 | 1 | I believe that the waste from this clean up project should be removed from the river and shipped to an appropriate hazardous waste facility. | EPA has noted your preference for off-site disposal. The dredged sediment to be placed in the CDF is not hazardous waste. Although it poses risks to human health and the aquatic life, so that it needs to be removed and isolated, the concentrations do not rise to the level of qualifying it as hazardous waste. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 40 | 2 | There are too many uncertainties regarding long term "storage" of this waste including Flooding, Earthquakes and the long term responsibility of monitoring this site. Let's clean up the river but do it in a permanent way. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. In addition, long-term monitoring will be required by EPA to ensure integrity of the CDF and protection of human health and environment. Please see response to Comments 2-3, 2-6 and 2-8 . |
| 41 | 1 | Reopen and adopt the previous interagency agreement with the Ross Island Sand and Gravel Company, whereby they would be allowed to extract gravel to a depth of 100 feet from their island pit free of charge. Then turn the pit over to the Port of Portland for the deposit and burial of contaminated dredge spoils from the Harbor. When the island is filled and properly sealed, it will be turned over to public ownership. To the best of my recollection the parties involved were the Oregon Department of Environmental Quality, the Oregon Division of State Lands, the Environmental Protection Agency, the US Army Corps of Engineers, the Port of Portland, and Ross Island Sand and Gravel Company. Somewhere in your files, you will have records of this agreement. Since I am retired, I do not have access to the exact time. | Thank you for your input. EPA did not evaluate Ross Island as a disposal alternative. |
| 42 | 1 | Concerning the Portland Harbor T-4 cleanup site, it seems to be a common sense silly idea to move hazardous waste from one spot in the river to another! Capping and lining the toxic waste in a submerged water environment is not good enough. | EPA has noted your preference for off-site disposal. However, both Slip 3 and Slip 1 require cleanup. Moving dredged sediment from Slip 3 to Slip 1 is not a significant distance. In fact, the likelihood that hydraulic dredging can be used due to the short distance to the CDF is an environmental plus because there are fewer impacts from dredging hydraulically. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 42 | 2 | Engineering studies often, time do not translate into reality. Leaks do occur, it's still in the same location, and it's near local ground water | Oversight and long-term monitoring are always an integral part of cleanup actions to ensure the engineering and design are functioning as intended. |

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| | | supplies. | |
| 42 | 3 | It won't help the area's economics by living or building new development near or on a toxic waste dump. | Cleaning up uncontrolled contaminated sediment will likely provide economic benefits for the Harbor as well as reducing the risk of direct exposure to contamination. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations. |
| 42 | 4 | If your going to spend any funds at all to clean it up, then do it right and build a permanent storage site in a safe and more acceptable location. Eastern Oregon sites, such as locations like Portland's garbage dump site near Umatilla come to mind where it's drier and less ground water conflict potential. Please get the waste out of the river, moving it around is not acceptable. | EPA has noted your preference for off-site disposal. The dredged sediment from Terminal 4 is relatively low level concentrations and what is allowed to be placed in the CDF will not be highly leachable or transportable by groundwater. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 43 | 1 | I am writing in opposition to a proposed plan to create a toxic dump in Port of Portland's slip 1, Terminal 4, across from Linnton, OR. I urge you to oppose this proposal, and to do all that you can to avert this project. | EPA has noted your opposition to this project. Please see response to Comment 1-1 . |
| 43 | 2 | I am a registered voter and taxpayer in the City of Portland, Oregon, and am highly opposed to this dump. We are spending millions of tax dollars to clean up the river, to make it more environmentally friendly for salmon and other desired river creatures, as well as for our families and future generations. This proposed dump threatens to undermine our efforts. | Thank you for your input. Please see the response to Comment 1-1 and Comment 23-3 . The Terminal 4 action will require a significant amount of mitigation, and the EE/CA and Action Memorandum describes both the process and initial performance standards that the mitigation will need to meet. Salmon habitat and restoration will be one of the primary objectives of the created or enhanced mitigation projects. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. |
| 43 | 3 | While this proposed site will be "protected" from the river by an earthen berm, such a berm can allow slow but steady seepage of the toxic wastes into the river. A monitoring well is proposed to monitor seepage, but I don't see how this will prevent the problem. | Please see response to Comment 5-2 . |
| 43 | 4 | Furthermore, inadvertent human error can upset the best of plans. A previous attempt by the Port to bury contaminants in the river near Ross Island failed; subsequent cleanup was very costly. And then of course, there are 'acts of God,' such as flooding and earthquakes, which could upset the plan and allow the contaminants to enter the river. | The Ross Island project was not an engineered CDF and is unrelated to this project. The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 . |
| 43 | 5 | I love our river and the views and activities it supports. I love to swim in the river. I love to eat salmon who swim up the river to spawn. I love watching children enjoy the river's sandy beaches along Sauvie Island. Please help keep our river clean and safe from all these activities. | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. The selected alternative is protective of human health and the environment. |
| 44 | 1 | I am writing to express my concerns about proposed plans for storing toxic waste in Portland. The Port of Portland wants to dredge contaminated sediments at Terminal Four and place them in a prepared, in-water disposal site at the adjacent Slip 1. The Port is also proposing that they accept an additional 600,000 cubic yards of sediment from the larger harbor clean up. Given that the slip is located on a fault line and that the proposed dam will be earthen, the logic of such a proposal seems to be, pardon the expression, on shaky ground. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic event are adequately addressed. Please see response to Comments 2-6 and 2-8 . |
| 44 | 2 | Further more, Portland is a growing city. The industries that have traditionally existed along the Port, near down town Portland are rapidly being displaced by urban housing. The industries complain of | Placing selected materials in a CDF does not create a new Superfund site. It takes uncontrolled contamination and places it in a secure and manageable environment at the same facility. The initial study area identified for the Portland Harbor Superfund Site extends from River Mile 2.5 to River 9. The |

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| | | a lack of heavy industrial land. Putting a toxic waste dump in an area, where the surrounding land will certainly need to be taken out of development seems rather short cited. The industries will need a place to be displaced to. Urban growth is inevitable. Placing the toxic waste dump in that industrial area will prevent the natural evolution of the city. | surrounding land will not need to be taken out of use as a Port facility. In fact, 17 acres will be created by the CDF for the Port to use consistent with its charter and City zoning. Please see the response to Comment 1-1 and Comment 42-3 . |
| 44 | 3 | The Port's motivation, that they can generate income from hosting a toxic waste dump seems like the worst motivation of all. This kind of thinking seems to be on the edge of ethical behavior. | The ability of the selected cleanup option to generate income for the Port of Portland was not a factor used in evaluating alternatives. |
| 44 | 4 | Increasing a neighborhoods likelihood of exposure to toxic waste for profit is not a way that we, as humans, can afford to think anymore. And please don't forget, many people live very close to that area. | Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 and 2-3 . |
| 44 | 5 | Toxic waste isn't called toxic waste because it is harmless. Please don't let the desire for profit prevent Portland from doing the right thing. | Toxic waste is, in general, a broad term that does not convey the specific circumstances and limitations that may make it toxic. Waste that is "toxic" from a direct exposure or bioaccumulation standpoint (for fish and/or human health), is not the same as waste that exhibits high leachability that cannot be safely contained. Any waste placed in a CDF would have to meet carefully established leachability criteria that will be developed with public input. |
| 44 | 6 | I support dredging these contaminated sediments and shipping them in specially prepared rail cars to an appropriate land fill in eastern Oregon. | Please see response to Comment 1-1 . |
| 45 | | I support dredging these contaminated sediments and shipping them in specially prepared rail cars to an appropriate land fill in eastern Oregon. | Please see response to Comment 1-1 . |
| 46 | 1 | We realize that it might cost less " the Band -Aid approach, but does it address the issue or only delay it?. Our river's quality are paramount to our lives, and to the fish and wildlife that live and drink from it. | The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Cost was not the driving factor for selection of the preferred alternative. Please see response to Comment 1-1 and 2-3 . |
| 46 | 2 | I ask you, the agencies spokesperson request the removal of all pesticides, mercury, PCB's and dioxins from the Willamette river. These hazardous sediments need to be stored in a properly permitted landfill where they cannot contaminate the river. | Please see response to Comment 1-1 . |
| 47 | 1 | I am writing you concerning the extremely upsetting issue of the EPA creating a toxic dump in slip 1, terminal 4 of the Willamette river, directly across from the Linnton neighborhood. We have lived in Linnton for five years and love the area. I am confident that every resident of our neighborhood would share the same feelings of extreme concerns and worry regarding this issue. I trust you will be sympathetic to the real concerns of everyone that lives in the area and seriously consider other alternatives to 'cleaning up the water front.' I appreciate your time. | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comments 2-3 and 5-2 . |
| 48 | 1 | Sean, I am aware of the proposed dump at Terminal 4, Slip 1, which I am personally and professionally opposed to for a number of reasons, not only the ones listed in this e-mail. | Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. See responses below. |
| 48 | 2 | ..as each year goes along the issues of continuing to be located in Portland, Oregon become more and more difficult. This is only one that the Port of Portland has done to the local community. | Thank you for your input. |
| 48 | 3 | ..the Port of Portland proposal does not allow for the replacement of warm water fish spawning grounds as well as the salmon, steelhead, | Please see response to Comment 6-2 . |

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| | | and sturgeon that make the area temporary home. | |
| 48 | 4 | Again, a toxic waste dump does not belong on the river! | EPA has noted your opposition to the project. Please see response to Comment 1-1 . |
| 48 | 5 | The only reason in which the Port of Portland wants the dump placed at Terminal 4 is to save the Port several million dollars in proper deposal fees. The Port of Portland does not care for the river, fish, and potential health problems to the public which use the river for water skiing and swimming. | Thank you for your input. The preferred alternative was determined to be the most protective and cost was not a significant factor between alternatives. Please see response to Comment 1-1 and Comment 7-2 . |
| 49 | 1 | I am concerned about the Port of Portland's plan, Terminal 4 Early Action Sediments Cleanup, to dispose of toxic waste by burying it immediately adjacent to the Willamette River, then capping it with concrete. Burial of this material in an active port with the potential for industrial accidents, in an active seismic area, and by a river with a history of flooding seems to be a very short-sighted solution that has the potential of exposing the citizens of Oregon and Washington to toxic waste for generations to come. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comment 1-1 , Comments 2-6 and 2-8 (earthquake and flooding) and 2-1 (fire). |
| 49 | 2 | Please do not approve this plan. | Thank you for your input. EPA considered all alternatives presented in the EE/CA and has selected Alternative C as the preferred alternative. Please see other Responses as to the issues considered by EPA in making this decision. Of particular interest may be responses to Comments 1-1 and 2-3 . |
| 50 | 1 | I oppose the plan to put toxic materials in the slip near Linnton. | Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see the response to Comment 1-1 . |
| 50 | 2 | Put effort into finding \$\$\$ to ship it to Arlington or somewhere else. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 . |
| 51 | 1 | I would like to register my strong objection to your planned dumping of toxic waste into the Portland Harbor. | Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see the response to Comment 1-1 . |
| 51 | 2 | Your planned use of Slip #1 as a toxic dumpsite is delaying the inevitability of toxic material leaching back into the main water system and into the ground water. I call to your attention the last Portland scheme to do essentially the same thing—the dumping of toxic waste in the gravel pit in the Willamette River across from Johns Landing, and covering it up with clay and rocks so that the River would not wash it back downstream into Portland Harbor. Millions of dollars were wasted in this venture. | The Ross Island project was not an engineered CDF and is unrelated to this project. The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of alternatives. Please see the response to Comments 2-6 and 2-8 . In addition, please see the response to Comment 5-2 for leaching concerns. |
| 51 | 3 | Bite the bullet and ship the waste to a toxic dump site in Eastern Oregon, and save us from injecting 1.2 million gallons of polycarbonate into the soil in hopes that this will neutralize the toxins present and not cause a far more expensive future cleanup problem. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 52 | 1 | I am writing to voice my opinion of being opposed to the above "Clean up the River" proposal wherein a toxic dump will be created across from the town of Linnton, Oregon, even though an earthen berm will be a divider between the dump and the river. | Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see response to Comment 1-1 . |
| 52 | 2 | I am a resident living close to this area and I most definitely don't want anything of this sort near my home where my family plays. I assume you would not want it for your family either. | Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 . |
| 52 | 2 | Any toxic waste removed from the river and surrounding areas should be trucked to an isolated inland location and buried very deeply. | EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 52 | 3 | Please reevaluate this plan and create a different solution for the issues. | Please see response to Comment 4-4 . |

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| 53 | 1 | As a resident of the town of Linnton, Oregon, across the river from the Port of Portland Terminal 4, I want to express my opposition to the plan to use Slip 1 as a Confined Disposal Facility (CDF) for toxic waste. This location is a mere 400 yards from the front door of our town. Adding toxic waste to the location is unacceptable. | Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 . |
| 53 | 3 | I recommend the application be denied. | Thank you for your input. |
| 54 | | NOTE that #54 was same as #28, Willamette Riverkeepers letter and this row is intentionally left blank. | |
| 55 | 1 | The Port of Portland is in the business of saving money. That's why we're all here today. You know, decades ago, they were the ones that polluted it. I helped. I'm one of the polluters. I put it in the river, at the direction of the Port, to expedite shipping in the cargo industry. And what I saw tonight is we're doing the same thing. We're putting costs first. And all we're doing, and it was mentioned here, we're going to – this might be a site for all potential parties, responsible parties. All they're doing is making one, big superloaded zone that can repollute the river again. | Thank you for your input. Please see response to Comments 2-3 and 5-2 . |
| 55 | 2 | I tried to get a technical question answered about where the test monitoring wells will be. Against the river. But anybody that works out at Terminal 4, works in a soda ash storage building, which is underground. Ground water is moving in all different directions. The only way you're going to be sure nothing's moving is complete monitoring around this site, completely, at different levels. Because computer models are one thing; Mother Nature is another thing. | It should be noted that there is an extensive monitoring well network on the upland portions of the Terminal 4 property for source control monitoring. This includes areas near and upland of Slip 1, where the CDF would be constructed. Past monitoring of these wells has allowed the Port to obtain an understanding of groundwater movement and direction. In addition, although specific locations for monitoring wells adjacent to the river and the CDF have not yet been determined, they are required should the CDF be constructed. The monitoring well network will be developed such that groundwater between the CDF and the river will be monitored and potential discharge of contaminants into the river, if any, will be detected. Corrective actions will be taken if the CDF fails to meet performance criteria. |
| 55 | 3 | We wouldn't be in this situation if we watched what Mother Nature did. But, no, we put costs first. | The preferred alternative was determined to be the most protective. Cost was not a significant factor between alternatives. |
| 55 | 4 | I have a lot of questions, but the main concern is, right now, we're doing this on the cheap. That's what we're doing. It's been a practice of the Port to do a lot of things – it spends a lot on public relations, but this is their responsibility. | Please see response to Comment 7-2 . |
| 55 | 5 | And the best way, the way that – you wouldn't have to worry in the future about mitigation if it wasn't there, if it was removed. We have to accept the responsibility of what we did out there, and by removing it, that's the best step to making it a safe river again. | Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 . |
| 55 | 6 | Oh, I have one other thing. Just to put the Port – in the Port's perspective. This is the Port's 20/20 vision plan about running the rail track over the slip. It's been there for five or six years. This is just an easy solution for them to keep building the Port bigger. | Thank you for your input. We were informed that the CDF was consistent with potential future development of the Port. Consistency with anticipated future land use is a factor that EPA considers in making cleanup decisions. |
| 55 | 7 | Except, what happens after this facility is built and we do our monitoring, and we discover our great computer model for the environment isn't working, and it's leaching back into the river? | Cleanup decisions routinely use engineering and modeling as decision-making tools and monitoring and oversight are important to make sure a facility functions as it was designed to do. Please see the response to Comment 5-2 . |
| 56 | 1 | I am strongly opposed to the Port's plan to store the hazardous waste, and I think it should be classed as that at this facility near the river. | Thank you for your input. Please see response to Comment 1-1 . |
| 56 | 2 | I'm very impressed by everything the engineers for the Port have said, the PR people have said, I'm very impressed, but when I see the reality of what happens – For instance, I'll give you an example, there was a restoration of | Thank you for your input. The bank restoration at Terminal 4 is unrelated to this project and EPA's decision. However, the Terminal 4 removal action will require long-term monitoring and reporting by the Port and EPA oversight. Please see the response to Comment 1-1 . |

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| | | <p>banks near this area, Slip 3 or Terminal 4, a very small area, and this was explained to us at the CAG what would happen. It was also very impressive, as it was tonight. However, about a year after this was accomplished, my husband and a small group of people went out to look at the actual restoration, and we found coal tar right on the facility. This is a carcinogen, and is a very surprising thing after listening to a very complicated presentation. What this says to me is that there's questions of ability, and accountability, and credibility that the Port has to answer for, and I really don't think that they should be storing this waste on the river with this plan that looks very good as a computer model on paper, but, on execution, probably won't be as good as this, and there will be many problems that will add to the expense as well as the risk to the river.</p> <p>So I'm strongly opposed to storing it. I think we ought to use the precautionary measure that is not risk-based. It identifies hazards, and I think we ought not to take the risk.</p> | |
| 56 | 3 | I think we ought to truck this stuff to Arlington, I think it should be considered a hazardous substance, and away from the river, away from things we can't predict, like earthquakes, and floods, and what will happen. | Your preference for off-site disposal has been noted. Please see response to Comment 1-1 and Comments 2-6 and 2-8 regarding earthquake and flood issues. |
| 56 | 4 | The engineering may be good on paper, but I just don't think that the physical – the physical things that happen along the way that we can't predict will result in a good result for all of us. | Thank you for your input. Please see response to comment 42-2 . |
| 57 | 1 | I want to thank the EPA for giving me an opportunity to be here tonight and to speak to all of you. Most importantly, I want to thank the community who came out tonight. It's so important. This is a done deal unless we stand up to this and say no. Do you know that? It's a done deal. So that's why we put a full-page ad in the newspaper on it, to try to encourage the community to get involved and let people know what the hell is happening in your river. We have an opportunity, Neighbors and Friends, to make this happen. But we have to do it by coming to these hearings, by calling our elected officials. This is a federal decision. We should be calling our federal legislators, we need to be calling, we need to be writing, and we need to make this river clean and healthy for us and for our children. | Thank you for your input. EPA agrees that community involvement is essential to making good decisions and we will continue to seek and encourage public involvement. In response to community concerns, EPA will include a public input process when developing the screening criteria to ensure your concerns are addressed. |
| 57 | 2 | The Port of Portland has not been a very good steward of their front yard. In fact, I would say they fouled their nest. | Thank you for your input. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. |
| 57 | 3 | Now we have a chance to do the right thing, and the right thing is to dredge this stuff out of here and send it by barge or by rail, it's very easy to do that, just rail it down there, and get it to Arlington in an appropriately designed landfill | EPA notes your preference for off-site disposal. Please see response to Comment 1-1 . |
| 57 | 4 | You know, Mike Struthers (phonetic) said we should just get this stuff dredged, and we have some kind of a start-off Dr. Seuss machine we could put it in, and it would come out inert, and we can put on playgrounds. But the fact is, that's probably not going to happen, and the best we can do with the mess that we've got to deal with is if we can get it into a landfill out of the river. | Thank you for your input. Please see response to Comment 4-4 regarding technologies and alternatives evaluated. |
| 57 | 5 | Putting it into a CDF is a make-shift option. It's going to leak. It's | EPA believes that the Terminal 4 cleanup and construction of the CDF is a long term permanent solution |

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| | | going to require monitoring. | and also contributes to the cleanup of the overall Portland Harbor site. Please see response to Comments 2-3 and 5-2 . |
| 57 | 6 | We've got PCBs in here that have been around from 35 years ago. They are still in the river like they were the day they went into the river. They're going to be here for hundreds of years, and all we're doing is leaving this legacy for our kids because at some point this thing is going to have to be dealt with. | Thank you for your input. The preferred alternative will permanently remove the contaminated sediments in the river and place them in a engineered disposal facility that will minimize or eliminate potential exposure to contaminants. |
| 57 | 7 | It's going to leak, it's going to liquefy in an earthquake, it's going to flood, it's not an appropriate way to clean up our river. So our organization is going to argue for landfilling. | Please see response to Comments 2-6 and 2-8 regarding earthquake and flood issues and 5-2 for leaching issues. Please see response to Comment 1-1 regarding landfill disposal. |
| 58 | 1 | The sustainability is often defined as having three components, the environmental, the economic, and the social, and I believe the social has been given short shrift in deciding to put in this plan. | <p>Thank you for your input. EPA took into account community impacts when developing alternatives for the Terminal 4 Removal Action and Alternative C represents very low short- and long-term risk and is anticipated to be neutral or positively influence the community. First, a significant amount of uncontrolled, contaminated sediment will be removed and contained in a well-engineered confinement facility. Best management practices will be required to reduce noise and other short-term impacts from the construction. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.</p> <p>Community concerns are important to EPA and significant public outreach was conducted for the Terminal 4 project. Meaningful community involvement is planned for the design and construction phases of this removal action.</p> |
| 58 | 2 | "As a resident of Linnton and the environmental chair for Linnton Neighborhood Association, I was initially hopeful when I heard that there would be an early action cleanup of the Willamette River. This was followed by shock to find out that the preferred action by the Port of Portland and the EPA is to build a toxic dump in the river only 400 yards from our historical town of Linnton. Far from being an isolated area, we are a town with a proud history predating the – Portland. Indeed, we were a thriving channel before the highway was widened in the '50s that raided half our businesses. Now we're a neighborhood of several hundred homes and more than a dozen businesses that live directly at where EPA plan to transform into a 15-acre toxic dump. My own doorstep is approximately 550 yards from the site in question. | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see the response to Comment 2-2 . |
| 58 | 3 | The Linnton Neighborhood Association has several serious concerns with this plan. First of all, it destroys any hopes we have for a viable waterfront in Linnton. The Portland Bureau of Planning made some recommendations inspiring renaissance, indeed, defining it over a year ago, consisting of neighbors, business, industry, and other stakeholders, including the Port of Portland, in order to consider the design of a mixed use village in Linnton. Having a toxic dump 400 yards away would essentially dash any hopes of any investor wanting to participate in the development of our town. In addition, no parents would want their children to play in the proposed park or – or the beach that's hundreds of yards from this toxic dump. This is personal. Would you want this toxic dump 400 feet from your home?" | Thank you for your input. Action is being taken at Terminal 4 because nobody should have to live next to uncontrolled toxic waste. It is incorrect to equate a CDF to a toxic waste dump. Please see the response to Comment 1-1 and Comment 2-3 . |
| 58 | 4 | Secondly, a 15-acre toxic dump adjacent to the river makes no sense, and Jane Harris has already made some pretty good points about | It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see response to Comment 1-1 . |

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| | | that. But what I do know is that even landfills on dry land leach eventually. | |
| 58 | 5 | I'm very concerned about, you know, putting a toxic dump next to three earthquake faults and into a flood zone. And it makes no sense economically. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 . |
| 58 | 6 | Even if there are some savings in burying the waste that are going to be realized because they're going to – we're going to take more waste from other polluters, the cost to our town, depreciation in property values and perhaps not getting our dream of having our village, is going to be amazingly expensive. | Our evaluation shows that all of the alternatives analyzed in the EECA will result in long term benefit to the community from reducing the risk of exposure to contaminated sediment. Note that the alternatives carried forward in the EE/CA are Alternatives A through D. The No Action alternative was not carried forward as it was found to not meet minimum threshold criteria. |
| 58 | 7 | "This is industrial sanctuary," we heard over and over again during our planning process, that this whole river is sacred industrial sanctuary, okay? And that was used as an argument against our developing our piece of the river. Why does it now make sense to take a 15-acre parcel and create – create a parking lot out of it, when every single inch of this is supposed to be sacred? | Thank you for your input. Alternative C represents very low short- and long-term risk and is anticipated to be neutral or positively influence the community. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations. |
| 58 | 8 | And then, finally, I think that this sets a really bad precedent in the sustainability community, and Portland is well-known as this incredible environmental city, and the EPA and the Port of Portland have been champions in the field of sustainability. I have personally sat – and actually sat directly and applauded your good work. EPA grants have funded amazing projects. The Port of Portland has done wonderful work. Creating a toxic dump in the Willamette River and calling it cleaning up river will be seen by both friend and foe as a cynical move driven by money, whether it is or not. | Thank you for your input. Please see the response to Comment 58-1 above. Cost was not a significant factor between the alternatives. Please see the response to Comment 5-3 . |
| 58 | 9 | Both the EPA and the Port of Portland have publicly supported the natural step, the four systems condition, precautionary principle, the cradle-to-cradle ideas. Please don't destroy our hope of a truly clean Willamette River for all generations to come by claiming that a toxic dump that's in a slip is the best solution for our beautiful river, for our town, and for our kids. | Thank you for your input. Please see the response to Comment 12-1 . |
| 58 | 10 | Many Linnton residents once played in this river, swam in the river, played – we even have a wonderful little beach. Nobody plays there anymore. We dream that once again that we will have a viable waterfront. | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. This Removal Action contributes to the long-term cleanup of the Willamette River. |
| 59 | 1 | We, as a neighborhood [Cathedral Park], have dealt with pollution in the river for quite some time. We dealt with a beach at Cathedral Park that's not usable. | Thank you for your input. |
| 59 | 2 | we have dealt with fish being not edible, and children having burned legs because of pollution. | Thank you for your input. EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. |
| 59 | 3 | We have dealt with being a dump site in the past. I don't think we want to be a dump site in the future, too. And we're talking about an unknown quantity of time. We're talking about years and years and years down the line. So my concern is this is going to be a toxic area forever. | Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 . |
| 59 | 4 | we are discussing a certain amount of risk here. There is risk. There is not zero risk. There is possible risk. | EPA will require a long-term monitoring program to ensure that any risk is minimized. Please see response to Comment 2-3 . In addition, please see response to Comments 2-6 and 2-8 for mitigating earthquake and |

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| | | | flooding risks. |
| 59 | 5 | We're going to have to monitor it for, what, a thousand – thousands of years? No one can guarantee what's going to happen in that amount of time. No one can guarantee that this is going to be a doable situation. | Monitoring is preferable to the risk of exposure to the uncontrolled contaminants presently in the river. Please see the response to Comment 42-2 . |
| 59 | 6 | People's health is not a minutia. I live in this community, and that's not minutia. Kids getting their legs burned by pollutants is not a good thing. We've dealt with this too long. | Protecting people and the environment from uncontrolled contamination is the reason a removal action was proposed at Terminal 4. Please see response to Comment 2-2 and Comment 2-3 . |
| 59 | 7 | It is time to pick up this pollution and move it someplace else, not next to the river and not next to our community. | EPA has noted your preference for off-site disposal. See response to Comments 1-1 and 2-2, 2-3 . |
| 60 | 1 | My name is Jim Robison. I'm a resident of the University Park Neighborhood, and I am also a member of the Portland Harbor Community Advisory Group. I just want to say that, first of all, I want this cleaned up as quickly as possible so I don't want long delays. | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. |
| 60 | 2 | But, also, I'm concerned that there are a lot of questions about this proposal, the preferred alternative, that have not been answered yet, and there were questions that were raised in the earlier part of the meeting tonight that I felt were not really very accurately answered when the questions were raised. So I'd like to get some more information about some of those. | Thank you for your input. |
| 60 | 3 | I will read the Chapter 8 that was mentioned about the risk factors because I'm afraid that when the alternatives were weighed, risk was not given adequate weight in the consideration, and I want to look at what the risks are because that is – what we're looking at here is a long-term potential for failure, and we want to make the decision that is best for the long-term safety and long-term best that is this community, not just what's going to be the quickest and shortest and what's going to be the cheapest in the short-run, but what's going to have the best long-term benefit. So I'm very concerned that that long-term risk was not adequately weighed. | <p>EPA will require a long-term monitoring program to ensure that any risk is minimized. Please see response to Comment 2-3. In addition, please see response to Comments 2-6 and 2-8 for mitigating earthquake and flooding risks.</p> <p>As discussed in Section 8 of the EE/CA, factors evaluated for long-term risk can generally be divided into two categories and include: 1) the adequacy and reliability of the action to achieve the RAOs, and 2) the potential risk of the action relative to other alternatives. As described in the EE/CA, the preferred alternative includes approximately 76% of the removal action area to be either capped or dredged. This will achieve permanent isolation of contaminated sediments and reveal a sediment surface within acceptable concentrations. Monitored natural recovery (MNR) will be applied to the remaining areas, which is expected to achieve permanent reduction of contaminants to acceptable levels within 5 years. Therefore, EPA believes that the selected alternative will achieve the RAOs, is a permanent solution, and is both adequate and reliable. The other factor EPA considered is the risk of the action compared to the other alternatives. In this case, long-term risk generally includes situations which could impact the integrity of the CDF, such as earthquakes and floods. While earthquakes and floods were considered (see response to Comments 2-6 and 2-8), the review conducted by EPA indicates that the integrity of the CDF will not be compromised. The long-term risk associated with this action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA Section 8). Therefore, the action does not significantly increase the long-term risk compared to other alternatives and benefits of the preferred alternative (see response to Comment 1-1), outweigh any potential long-term risk associated with it.</p> |
| 61 | 1 | We do have a lot of toxic problems out here in North Portland. And we need to remember that risk is a level of acceptance that we have to decide every day; what the risk is, what risk do we want to accept, whether it's storing it here, storing it somewhere else, or capping it. | Thank you for your input. |
| 61 | 2 | I want to make sure that's in the record that I want go in stating that I firmly am against any capping in our river. Whatever the other two solutions or three solutions we wish to go with, capping should not be on the table for us to discuss. So whatever we go forward from out of | Your concern about capping has been noted. However, when the location is appropriate (no significant erosion or scour potential) and the capping is planned and implemented with care, capping can be a valuable tool for reducing risks posed by contaminated sediment. Thus, the benefits of capping, as well as removal actions that contribute to the overall cleanup of the Portland Harbor, are two cleanup approaches |

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| | | here, the cleanup – understands that the rest of the river cleanup, capping is not an acceptable option unless it can be done somewhere that is not going to be impacted by any of our natural environment activities, whether we have a natural event. | that EPA selected for the Terminal 4 project. |
| 61 | 3 | The other thing is just I understand what we're trying to do with the CDF, and compared to hauling it to Arlington, we do end up storing it. We got to store it somewhere. So, then, once again, we have to look at the risk of moving it to the storage at Arlington, which is why they're exploring a CDF, which not blind. What is the level of risk contained in what sediments we put into a CDF, what's acceptable to take to Arlington. | It will be important to develop suitability criteria for determining which sediments present a low enough risk to be placed in a CDF and which ones need to be taken to an upland landfill. At this time, tests on the Terminal 4 sediment indicate that it does not meet the standards for hazardous waste disposal. The community will be involved in the process of developing these criteria. Please see the response to Comment 1-1 . |
| 61 | 4 | We are going to set the tone for the cleanup of this river, and I hope that we study it as individuals, as a community, and the EPA takes responsibility to know that this is going to set the tone for the cleanup. | Thank you for your input. The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. As such, the benefits or specific removal alternatives, such as a CDF or capping and contribution to the overall cleanup of the Portland Harbor, are significant balancing factors that EPA needs to consider related to the Terminal 4 cleanup. Whether additional contaminated sediments may be disposed of in the CDF will be decided in future cleanup decisions. |
| 61 | 5 | I appreciate all the effort that the Port has made into it and the community coming out. And I do want to take the time to thank everybody that has come here that will comment either personally or by e-mail. Please be aware of the whole cleanup process, not just the T-4, and become aware of how you can have input in that. | Thank you for your input. EPA appreciates your involvement and support. Please see the response to Comment 12-1 . |
| 62 | 1 | During my initial review of the course of the work, then, I was surprised by the comparison of risk between the preferred Alternative C, the CDF, and the landfill disposal, Alternative B. | Thank you for your input. |
| 62 | 2 | This CDF alternative is presented as being more protective of human and environment health based on being – or having the least impact to the communities, least amounts of handling and transport, and prevention of sediment resuspension by hydraulic dredge. However, hydraulic dredge is – speaks for – for the landfill disposal options as well, and with the water being included the alternative which is not currently presented in the work plan. I know that dewatering works because I've been at the Columbia Boulevard Waste Water Treatment Plant many times, which is a very efficient – economically and engineering energy efficient system for dewatering. That way, it's right across the street. | Hydraulic dredging is an attractive option for collecting and transporting contaminated sediments into the CDF. Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills. As a result, after review of available information, hydraulic dredging combined with necessary dewatering for disposal in upland facilities does not appear to be practical for this project. Dewatering dredged sediment is difficult and requires specialized equipment and has significant space requirements. Based on the amount of sediment to be dredged, dewatering and transport off-site appears to be cost prohibitive. In addition, transport of wet sediment, if not dewatered onsite, also has numerous disadvantages. This includes obtaining a large amount of properly sealed containers and the higher potential for releases during transport. |
| 62 | 3 | In comparison of the risk of accidental releases, it's important to consider the probability and magnitude of consequences. The preferred Alternative C presents a much higher risk because the consequences of CDF failure and \$10 million worth of sediments going into the river are much more severe than, say, a railcar failing on its way to the landfill on an upland area. The CDF alternative may also be riskier based on probability. | <p>Thank you for your input. Potential risks from rail or barge transportation of contaminated sediment are very different than those posed by disposal within a CDF. For instance, the probability of a significant earthquake or flood impacting the CDF and releases of contaminated sediment is low. Please see responses to Comments 2-6 and 2-8 regarding earthquake and flooding issue.</p> <p>Potential risks posed by off-site transport, not only include releases via transportation failures (i.e. crashes, etc), but also include health and safety issues associated with handling contaminated material, which is much greater for the other alternatives. Therefore, when weighed together, the long-term risk associated with this removal action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA Section 8).</p> <p>Environmental benefits and factors used for selecting Alternative C include: 1) the amount of handling and transport of contaminated material is significantly minimized over other alternatives, 2) impact on the community is expected to be less since all construction activities associated with implementation of Alternative C is confined to the Terminal 4 facility, 3) the short-term risk of recontamination is minimized</p> |

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| | | | during implementation because a relatively small volume of sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the river, and 4) the long-term risk of recontamination is reduced because it eliminates the Slip 1 area. |
| 62 | 4 | Unlike Commencement Bay which has been referenced several times tonight up in Tacoma, the proposed CDF is sited in a flood plain. In an earlier presentation, there was some – the idea that there might be response to – concerns about floods, which, as – as I recall, there was no discussion for those, and there was very little discussion of floods within the work plan. So the Port is proposing that we cross our fingers for the next six years or more and hope that the floods of 1964 and 1996 don't recur. So I do have a question for the EPA, and that question is has EPA looked at aerial photographs of Terminal 4 in 1969 when that flood was occurring? Have they interviewed the folks, the longshoremen for instance, that were there in 1994, and the same in 1996? I recall that the aerial photos of 1996 covered the entire basin area with floods. | The proposed Removal Action has undergone an evaluation by EPA to make sure that flooding events were adequately addressed in the evaluation of Alternatives. As part of the review, aerial photos were evaluated, including the 1996 event. As a result of public comments, EPA will require the CDF design to consider flood events. The additional performance standards are further discussed in the Action Memorandum. Also see response to Comment 2-8 . |
| 62 | 5 | Beyond the port being sited in a flood plain, there's also the potential for a seismic event to occur that will be similar to the 1989 Loma Prieta earthquake. It's a very unusual earthquake, I think it's low probability, but the magnitude of the consequences are similar to a large flood event, and in that earthquake, there's still the action of refill in the south of Market District in San Francisco. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic event are adequately addressed. Please see the response to Comment 2-6 . |
| 62 | 6 | So in my opinion, the combination of the CDF being sited in a flood plain on infill presents an extremely high risk to our community. I'm confident that if EPA performs a critical engineering analysis of the risk, that they will result in the same opinion. | Based on multiple comments like yours, EPA required a review of the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain relatively low-level contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment. It was also determined that the long-term risks do not outweigh the environmental benefits of the Terminal 4 project. |
| 62 | 7 | There's a couple of reference documents. I'd like to refer EPA to the American Institute of Chemical Engineers documents on hazards evaluation that includes both seismic events and flood events. | Thank you for your input. |
| 63 | 1 | I find reports – cost analysis lacking. They talk six years, eight years, ten years, fifteen years. They build an airport – an airport near Progress Villa in Swan Island. It's gone. That's less than a hundred years ago all that occurred. It was a dry dock. Many thousands of dollars were put into it. It disappeared. | The cost analysis presented in Appendix O of the EE/CA was completed consistent with EPA's NTCRA guidance. The costs include both capital expenditures for construction and long-term operation and maintenance. In all cases, removal actions with a capping and/or CDF component, costs for long-term operation and maintenance were estimated for a period of 30 years. In addition, it should be noted that a number of institutional controls will be implemented as part of the action, which will allow EPA to track the project and ensure that the remedy selected is not compromised. Proposed institutional controls include lease language and notifications and easements that preclude any subsurface disturbance of the CDF. |
| 63 | 2 | There's the soda ash sheds that we've been promised that ash would not flow across the neighborhood, it's going to be monitored. Last week, it was drifting across the neighborhood. Are they monitoring it? There's a fire at Schnitzer. Nobody was monitoring that. That's from the Port. | Thank you for your input. Because the dredged material will be wet, it is not anticipated that dust will be generated by the project. At the time the top cap material is placed in the dry, measures will be required to minimize dust blowing into the neighborhood. |
| 63 | 3 | I think that the cost analysis is only, as the Port has done it, for a limited time. The waste proposal is for an indefinite period of time. Why not make the cost analysis for that same length of time with all the variables that are in there? | The cost estimates for the Alternatives were prepared in accordance with established EPA regulatory guidance. All of the alternatives were evaluated using the same set of cost numbers and criteria. EPA is satisfied with the cost estimates provided by the Port. |
| 63 | 4 | I do not trust what's going on. I think that there were some people that mentioned the social aspects. Well, part of the social aspect is the trust in the neighborhood, and that is lacking. I don't trust them. | Thank you for your input. Please see the response to Comment 12-1 . |

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| | | We've been fooled before. We should not have a Superfund site rebuilt as another Superfund site. Thank you. | |
| 64 | 1 | I reside across the river, a little bit south of Linnton. I'm up on a hillside, and I get to watch what goes on in the river every day. And I see the ships come by, and I see the tug boats go by, and I see the Toyota ship come in, I watch the wonderful longshoremen do their job, and I see the soda ash, and I dust every day because of the soda ash. I also see the fires that go on at Schnitzer Steel, the little car explosions that rattle my windows, and the big fires that occurred most recently just a couple weeks ago. And I'm looking at all of this, and then I pick up the Oregonian and I find out that in my beautiful view, I'm also going to have a toxic waste dump site, and I'm – and I have not even really thought about this much before. It made me so mad, that I sat down and wrote a letter. | Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. The risk of fire and significant dust from the Terminal 4 removal action is very low as the material being handled will be non-flammable wet dredged sediment. |
| 64 | 2 | Toyota would want to use a parking lot that sat on a toxic waste dump site, that is next to Schnitzer with exploding automobiles and causing fires and fumes to come all over those lovely Lexuses and Avalons and Toyotas? That's what Toyota would want? It certainly wouldn't want me to buy a Toyota, and I don't even drive a Toyota at this point. | The proposed alternative reduces or eliminates exposure to contaminated sediments and the CDF should not affect the potential Port uses on the upland portion of the facility. |
| 64 | 3 | But I'm also wondering, if little comments like that are going by, what else in this presentation that was technical that I didn't quite get it went by me and maybe went by you? And I'm opposed to all of this, and I intend to write my congressman. | Thank you for your input. In order to make a good decision, EPA must consider a wide range of technical, economic and community factors. |
| 65 | 1 | I'm simply a resident of the Cathedral Park Neighborhood, and we live between the McCormick Baxter and Terminal 4, two polluted sites of course. And it seems – it makes sense to me that we should probably dispose of this waste on site if it makes sense. | Thank you for your input. Please see the response to Comment 2-2 . |
| 65 | 2 | It doesn't make sense to dispose of it, of course, that's going to reenter the river or cause problems due to natural causes like earthquakes and floods. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed. Please see response to Comments 2-6 and 2-8 for earthquake and flooding issues and 2-3 and 5-2 for long-term reliability and safety. |
| 65 | 3 | <p>However, I asked the question and didn't get a clear answer, but, apparently, there's another way of handling this, and in watching the slide presentation this evening, however term it is – the water word for it, I realized that this is a built-in opportunity, it would seem to me, to the Port for disposing of this toxic waste. That is to say, they have a bathtub essentially next to another bathtub, and they're going to pump one bathtub into the other.</p> <p>The thing to do, then, is to line this bathtub in such a manner that nothing's going to get out of it, it's going to be an impervious liner, such as some of the things they're using in waste disposal sites throughout the world. We've come a long way in waste disposal sites, and there are ways of making them impervious, just move them around in case of an earthquake and also keep the water out in case of flood. And I think it would be the closest one we can get to a guarantee that this toxic waste stay where it's supposed to if they put a 20-foot cap on it and monitors on all corners of the compass. This is going to cost a little more than, it appears, the proposed plan one would be, but it would cost a heck of a lot less than taking it to</p> | Based on engineering factors, lining the CDF is not practical or needed (see Appendix K of the EE/CA). Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Liners are typically used to prevent leaching of chemicals through the bottom of the disposal facility and into the environment. The sediment to be disposed in the CDF is non-leachable; therefore, a bottom liner is not needed. In addition, it should be noted that contaminated sediment is being consolidated into a CDF primarily to mitigate potential for direct contact of these sediments in the river environment. CDFs and other in-water confined disposal facilities have been successfully used at the Commencement Bay Superfund site. |

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| | | Arlington, which is really moving the problem from one part of Oregon to the other. | |
| 65 | 4 | So I would propose some thought be given to what is being done at McCormick Baxter, and that is driving sheet metal down into the earth and then placing a liner inside that, putting the toxic waste inside that liner, and putting an impervious clay-like soil on top of that. In other words, make a great big sausage with the thing inside of it. And then it wouldn't make a whole lot of difference whether it's a parking lot on top of it or a manufacturing company. And I would like to be assured at least some consideration might be given to this proposal. | The specifics, including contaminant concentrations, of industrial operations that generated the contamination and characteristics of the McCormick and Baxter site and the Terminal 4 site are very different. Only sediments that have low likelihood of leaching will be allowed in the CDF. |
| 66 | 1 | <p>I have what might seem like a relatively small and technical question for the EPA. It has to do with the cost estimates for the four options, in the report – the spec report that I was reviewing. It looks like that part of the decision for Alternate C relies on a \$10 million dollar estimate cost recovery that EPA or whoever pays it would get because you not only have the dredging from this particular situation, but you'd also have future dredging of sediments that will be put into the site, so you actually save money towards the future, so that goes to the estimate for the cost. I'd like more maybe justification from EPA about sort of the accounting of this. It seems to be an interesting sort of – in a sense, not tricked, but interesting way of doing things.</p> <p>So what it does is two things. First, it takes an estimated sort of value of future sediment going into the site, which we can't be sure now that it's definitely going to go in this site, but they're saying, well, we'll find some sediment somewhere, the other Superfund materials or there will be other sediment from other dredging that will go in there, but assuming that, not so ensuring that. So that's a little bit of a tricky thing in terms of the money. And that's key, because by allowing that \$10 million estimated value for future sediment that's going into the site, it takes what's the most expensive of these four options and makes it the least expensive. If you look through the EE/CA draft report, it's actually option – Alternative C is the most expensive up front, but with this estimated value, goes down to the least expensive.</p> <p>The second thing it does is it sort of biases the future decisions, because, if you think about it, the next time we come to a meeting where we're going to talk about some other slip or some other area we're thinking about options, one of the options will be taking the sediment and putting it in this same spot. Well, we will already have sort of done that. We will restart that process of setting up a toxic waste dump in that other slip, so we're truly biasing future decisions as well. So it's something that I'm hoping that EPA could give us some more information about, sort of about how this accounting works, and how and in what ways this won't bias future decision making, because it seems to me that it will bias it.</p> <p>Now, all that said, does this make this the wrong decision? I'm still not sure. I haven't looked at this in a lot of detail. But I just want to – I want EPA to really think more – or tell us more, tell the citizens more,</p> | <p>The estimated costs presented within the EE/CA reflect a conceptual stage of development of each alternative, generally about 10 to 15 percent of design level. In general, the cost estimates were prepared in accordance with regulatory guidance for cost estimating. EPA guidance provides that estimates should provide values within +50 percent to -30 percent of actual short-term and lifecycle costs for each alternative evaluated.</p> <p>The EE/CA costs reflect the Ports experience with past projects. The anticipated cost associated with landfill disposal (i.e., includes the cost of transportation and disposal fees) was estimated at approximately \$30 per ton. This unit rate was used for all alternatives where applicable (i.e., Alternative C and D). According to the Port, they have paid \$28.85 per ton (2003) and \$30.87 per ton (2004) for landfill disposal and trucking costs. As such, the \$30.00 per ton appears reasonable. Based on the nature of sediment (i.e., soil type and degree of saturation) a conversion factor of 1.6 tons per cubic yard was applied. As a result, the disposal unit rate was determined to be \$48.00 per cubic yard (i.e., \$30 per ton × 1.6 tons per cubic yard). The low end of the disposal cost was selected to be \$24 per cubic yard (i.e., one-half of the high-end cost, with the most likely unit cost being \$30 per cubic yard). The resulting total benefit of the CDF excess capacity (i.e., 560,000 cubic yards) was then calculated to be \$16,800,000. Due to uncertainties associated with the timing and the market-driven nature of the benefit, the total calculated value was discounted by 40 percent, resulting in a dollar value of approximately \$10,000,000.</p> <p>The CDF does not bias EPA's future decisions. Although the CDF may be an additional disposal option to consider in future cleanup decisions, whether or not the CDF will be determined to be appropriate for the sediment being dredged and/or a protective alternative will need to be evaluated and a decision related to that cleanup will be made. As previously mentioned, prior to accepting and/or placing any additional contaminated sediments within the CDF they will be screened to ensure that they are of similar nature as the final screening criteria developed for the CDF. Having an on-site disposal facility may generate more interest by other facility owners to address contamination at their sites sooner, if they believe that the CDF may be more efficient, implementable or cost-effective. However, EPA's review of such a proposal will need to consider the protectiveness of disposal in the CDF compared to other cleanup approaches or disposal options.</p> |

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| | | about this accounting through the process, because it seems a little bit problematic at best. Thank you. | |
| 67 | 1 | It's really interesting to sit through these processes which go on every time something important is happening in the community regarding pollution in the river, and I recognize how much all of us are disadvantaged because we don't know how to read an EE/CA and know what it's saying. | EPA values and encourages public comments on projects affecting the community. EPA tries to conduct a variety of public outreach activities that help non-technical community members understand the information presented in the EECA in order to make informed decisions. |
| 67 | 2 | I have a strong prejudice in favor of the preferred method because I don't want to see these sediments, which are a limited class of toxic waste which I don't think would be destined for Arlington if they left here. I think that this is a level of toxicity that, as a community, we can take responsibility for. | EPA agrees that the proposed action is an appropriate choice to protect human health and the environment. Based on existing information, the sediment at Terminal 4 passes the typical tests for characterizing material as hazardous or non-hazardous waste. Given the selection of an on-site disposal facility, the Port will remove more sediment from the environment and place it in a well-designed disposal site. |
| 67 | 3 | I don't think that we can depend on the Port, and I'm even more concerned about the other – the other potential responsible – the PRPs to take responsibility for anything that's capped or anything that's stored along the river. I think that it's important that we recognize that the only people who can really take responsibility for that – for those toxins are our community. | Thank you for your input. Under the Superfund laws, viable Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. |
| 67 | 4 | I'd really like to challenge the EPA to define for us the length of time that there is risk involved in anything that's stored along the river, what things need to be watched and need to be monitored, not just assign that responsibility to some company which may not be around, or which may have different leadership, or may have different funding, or who knows what, sometime in the future, so that we, as a community, can know what's here and how we can take responsibility for it. | Please see the response to Comment 2-3. A monitoring system will be established at the Terminal that will not only evaluate the effectiveness of the CDF but all other Remedial Actions implemented. The Port, being a public agency, has long-term stability and responsibility for the action implemented. |
| 67 | 5 | Dumping it someplace else is going to put it in some other community's lap, and I have no idea – I have even less confidence that that community is going to take good care of it. But on the other hand, I – right now I have no idea what's the responsible caring for these toxics. | Sometimes there are no easy answers to problems and that is why the EE/CA looked at a number of cleanup alternatives in order to find one that best meets site-specific needs and other evaluation criteria. Please see the response to Comment 12-1 . |
| 67 | 6 | I don't think that the EPA is doing its job unless it can inform us, as concerned citizens, how we can take care of this problem, not just for the next five years, but for the next hundred years. | EPA believes that construction of the CDF is a long term permanent solution and also contributes to the cleanup of the overall Portland Harbor site. Please see the response to Comment 1-1 . |
| 68 | 1 | I am sending you my objection to the Port of Portland plans to dredge slip 3 at Terminal 4 and fill it with toxic waste, then cap it with concrete and monitor the site. | EPA has noted your objections to this project. Please see response to Comment 1-1 . |
| 68 | 2 | First, it seems to me that mitigating one Superfund site on the Willamette River by creating a new one is ludicrous. There are already available in Oregon suitable toxic waste disposal sites without creating new ones. | The Terminal 4 removal action is within the initial study area of the Portland Harbor Superfund Site. The CDF will be constructed within the existing Superfund site and will not create a new site. The Terminal 4 cleanup takes uncontrolled contamination and places it in a secure and manageable environment. Please see response to Comment 1-1 . |
| 68 | 3 | Yes, the cost of such disposal would probably be higher economically, but for the protection of the Willamette/Columbia system, there is no justification to create a new superfund site. The cost to our environment could be far above the difference in cost of proper disposal of the material involved. The Port's proposal is short-sighted thinking. | Thank you for your input. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. It does not mean just moving it from one place to another or creating a new contaminated site in the river. Slip 1 contains contaminated sediment that needs to be addressed as well. The ability of the selected cleanup option to generate income for the Port of Portland was not a factor used in evaluating alternatives. |
| 68 | 4 | Secondly, the Port's decision to create a new Superfund site within | Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. |

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| | | the Port of Portland would be a decision to condemn an actual and potentially useful asset of the Port. What legitimate business would want to lease a site that has proven contaminants? No matter what was written into the lease, the lessee would share responsibility for the site. There are not unlimited berths available on the Willamette/Columbia system with rail, truck and barge access. Contaminating an existing site simply destroys another viable Terminal. | The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations. |
| 69 | 1 | The last place a toxic dump should be located is in an area where people live and work!!! | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comments 1-1 and 2-3 . |
| 69 | 2 | The proposed dump is yards from Linnton's community center – it is the heart of our town. It is a location where parents leave their children before and after school, all the while trusting they are in a safe environment. We all deserve the best environment for our families to live in. The people of Linnton work hard to make this area a safe and wonderful place. | Thank you for your input. Please see response to Comment 2-2 . |
| 69 | 3 | I know there are alternatives to the current plan and I ask you to PLEASE find another alternative to creating a toxic dump at slip 1, Terminal 4 in the Linnton neighborhood!! | Please see response to Comment 4-4 . |
| 70 | 1 | we favor capping and natural recovery whenever possible. | Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment. Each of those actions are included as part of this Removal Action where it was determined safe to cap contaminated sediment and where contamination concentrations was low enough and the dynamic system of the river system was likely to attenuate the contamination. |
| 70 | 2 | In areas where dredging is a necessity, we want dredge spoils removed from the Willamette River and deposited in a secure upland facility, where they are not a future hazard to the river or ground water. | Thank you for your input. Please see response to Comment 1-1 . |
| 70 | 3 | We oppose the use of Terminal 4, Slip #1 as a low-level waste depository. It makes no sense to remove waste from the main Willamette River and deposit the waste adjacent to that same river. This is an unproven technology, and we do not want a situation to arise where the procedure would have to be redone in future years. | Please see response to Comment 1-1 . Only sediments that have low likelihood of leaching will be allowed in the CDF. CDFs and other in-water confined disposal facilities have been extensively used in the Northwest. No difficulties were encountered at these CDFs. Based on available information, all CDFs in the Pacific Northwest function as intended. |
| 70 | 4 | We are concerned about possible leakage of contaminants from this fill area even though we understand that the safeguards by today's technology would be employed. | Due to the proposed criteria for construction of the CDF, leaching of substances is not likely. In addition, suitability criteria will be established for evaluating material that would be placed in the CDF and ensuring that they do not include contaminants that would dissolve or leach. Please see the response to Comments 2-3 and 5-2 . |
| 70 | 5 | Fish and wildlife habitat will be lost if the area becomes a low-level waste depository and appears to us to be a poor environmental choice. | A Biological Assessment (BA) evaluated the potential effects of the Preferred Alternative on Federally listed and proposed threatened and endangered species. There will be unavoidable loss of habitat through creation of the CDF and dredging Slip 3 for which appropriate mitigation will need to take place. Please see the response to Comment 6-2 . |
| 71 | 1 | This letter is in regards to cleanup of contaminated river sediments at the Port of Portland's Marine Terminal 4 on the Willamette River. We operate a flour mill at Terminal 4 which is located adjacent to one of the four sites listed as alternatives for the Portland Harbor Superfund site cleanup. Given the opportunity for public comment, we asked our environmental expert to review the plans and they have expressed the following concerns with the proposed site located at Slip No. 1. | Thank you for your input. |
| 71 | 2 | At the current stage of development, the proposed early action | It is highly unlikely that dredging or disposal of contaminated sediment from Terminal 4 would result in |

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| | | <p>remedy for the Portland Harbor Terminal 4 superfund site presents significant concerns for potential cross-contamination of hazardous constituents in the sediments to be dredged and Cereal Food Processors (CFP's) grain storage and processing operations. Hypothetically, such cross contamination could occur via migration and deposition of aerosol or dust generated by the dredging & disposal activities, or volatilization and air transport. Once airborne, contaminants from the sediment dredging activities or transfer into the proposed confined disposal facility in Slip No. 1 could migrate into CFP's grain processing operations through the following pathways:</p> <ul style="list-style-type: none"> - Deposition of fugitive dust or aerosol into the open air unloading pit where grain in railcars is emptied into a concrete pit that discharges through a screw conveyor into an elevator leg that transfers it into storage silos. - Migration of fugitive dust or aerosols into the facility buildings through natural draft openings (windows, doors, open vents) or through the forced-draft ventilation system, with subsequent deposition inside the processing plant. - Intake of vapors, fugitive dust or aerosol through blowers that provide airstreams for pneumatic conveyance of grain and milled product throughout the processing plant. Many of these blowers pull their make-up air from external locations where intake of the potentially airborne contaminants could occur. <p>These potential contaminant migration pathways are significant concerns to CFP, given the close proximity of the proposed confined disposal facility to the CFP operations (the center of our facility is approximately 400 feet from the north edge of Slip No. 1) and the fact that the CFP would be downwind of Slip No. 1 for a considerable amount of time. The Portland Oregon Wind Rose indicates that the most prevalent wind direction (from the south) is directly in-line with the center of Slip No. 1 and the CFP facility, and that some portion of Slip No. 1 would be upwind of CFP for approximately 50% of the time.</p> | <p>detectable concentrations of dust, aerosols, or vapors. The removal action design will include a provision that contaminated sediments must be wet when they are being transported and placed. This will significantly minimize the potential for airborne contaminants at any time. In addition, due to the nature of the contaminants present in the sediment, they are unlikely to volatilize at concentrations which would be detectable in air. However, as part of the overall health and safety plan, EPA will require some air monitoring, likely in the form of minirae or other similar technologies. Please see the response to Comment 2-7.</p> |
| 71 | 3 | With respect to potential contamination of CFP's grain-processing operations, of the suggested alternatives (capping, monitored natural recovery, and dredging), capping and monitored natural recovery are least likely to adversely impact the grain operations. | Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment under the appropriate circumstances. The preferred alternative includes areas which will be capped or allowed for monitored natural recovery. However, EPA has determined that some contaminated sediment needs to be removed due to the risks posed and the area they are located in is an area where active commercial shipping uses could affect the long-term integrity of a sediment cap. |
| 71 | 4 | Dredging has the greatest potential for adverse impacts, since contaminated sediments would be disturbed and exposed to the air when pumped or directly transferred into a barge or directly transferred into the confined disposal facility. These activities could allow for evaporation of volatile compounds or generate an aerosol containing hazardous constituents. Also, any contaminated sediments that are spilled or otherwise deposited onto dry surfaces (e.g. the edge of the Slip or deck of barges/dredging ships) could dry and become available for formation of fugitive dust if disturbed after | Thank you for your input. Please see response to Comment 2-5 . |

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| | | drying. | |
| 71 | 5 | Should dredging become the selected alternative, disposal options include on-site disposal in a confined disposal facility or off-site disposal in a landfill. Both of these alternatives require sediment dewatering and transport, and would have comparable potential for volatilization and the generation of other air emissions described above. However, as proposed, the confined disposal facility would be constructed with excess capacity. This could extend the overall operation schedule of the unit, allowing for disposal of sediments removed from other contaminated sites, and would delay the final capping of the confined disposal facility. There may be problems associated with potential air emissions and other long-term maintenance of the confined disposal facility if it is left uncapped for an extended period. | <p>Sediments to be disposed in the CDF will not be dewatered, thus minimizing the potential for airborne fugitive dust. A Removal Action Area-specific Health and Safety Plan (HASP) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate dust control mechanisms. Please see response to Comment 2-7.</p> <p>A temporary cover will be required after the CDF has been filled with sediment from Terminal 4. A maintenance plan will be adopted for this cap to limit fugitive dust. However, the temporary cap will consist of clean fill material. If it is decided that additional contaminate sediment can be disposed of in the CDF, similar controls during disposal will also be required by EPA for these actions.</p> |
| 71 | 6 | Based on these concerns, CFP opposes the early action remedy currently proposed for the Portland Harbor Terminal 4 superfund site. If this remedy is approved, CFP reserves the right to comment on the confined disposal facility operation and maintenance plan and the type of future waste that could be disposed in the unit. We also reserve the right to review and provide comments on the design and construction documents, including the structural design and Construction Quality Control (CQC) plan. | Your participation in the design phase and development of suitability criteria for materials to be placed in the CDF is welcomed. Please see the response to Comments 1-1 and 12-1 . |
| 71 | 7 | For any remedy proposed for this superfund site, CFP would request that a series of best management practices be employed, including air monitoring during all operating periods, dust suppression/control, spillage control, protection of our grain processing operations with a construction-free zone, and in-place plans to respond in the event of an air-monitoring exceedance. It may be possible to time construction activities with prevailing wind direction and intensity in the most favorable conditions, to minimize impacts to the grain operations. | Please see the response to Comment 2-5 . A Removal Action Area-specific Health and Safety Plan (HASP) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms (e.g., dust control) and adhering to legally applicable requirements. In addition, a detailed Removal Action work plan will be prepared describing the construction activities and their schedule, procedures to protect the public, site workers and the environment during all field activities. |
| 72 | 1 | As good river stewards, we appreciate the effort put forth by all in cleaning up the Portland Harbor, but are concerned about contamination if the method of cleanup allows downstream migration of these contaminants. This could be a catastrophe for any affected properties when it's time to dredge. | EPA did not evaluate any alternatives that would allow downstream migration of contaminants. Please see the response to Comments 2-3 and 5-2 . |
| 72 | 2 | We suggest two actions; the first being a sampling effort to establish solid baseline knowledge of river sediments downriver in the channel. The second would be a repeat sampling during and after the project to assure you and our members that little or no migration occurred. | In evaluating the long-term effectiveness of the Removal Action, EPA has identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the MNR and to verify the long-term adequacy of the performance of the sediments caps. Post removal action confirmation sampling and analysis will also be conducted after construction to provide direct measurement of residual concentrations. In addition, sampling being completed as part of the Portland Harbor cleanup may also be used in evaluating the Removal Action efforts. More detail on post removal action monitoring can be found in the EE/CA in Appendix K. |
| 73 | 1 | - it is a dumb idea. No matter how powerful the economic or political or expedient, placing hazmat in Slip 1 on the Willamette River "is a dumb idea". | EPA has noted your objections to the project. Please see response to Comment 1-1 . |
| 73 | 2 | - as professionals you know the power of water. And you know as well, rivers are ecologically active events; they flood; silt; meander; erode. Rivers cannot be contained for long – ask the corps of engineers about the Mississippi – no dam, berm, containment liner | Based on community concerns, EPA reviewed the adequacy of the CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments at the Slip 1 location. Please see response to Comment 1-1 . |

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| | | can last. The river will breach it. | |
| 73 | 3 | Why are we even talking about placing hazmat at the river's edge – when a viable, common sense alternative exists? At hand we have a railroad, bulkrolling stock, and a dry, benign site in Eastern Oregon willing to accept and monitor the disposal of Willamette Hazmat. ALTERNATIVE D. You must do the right thing – not the expedient thing. You must use common sense. Placing hazmat anywhere along the Willamette is "a dumb idea". It sets a bad precedent. | EPA has noted your preference for upland disposal. Please see response to Comment 1-1 . |
| 74 | 1 | After reviewing the EE/CA for the Port's proposed Early Action at Terminal Four, comments from Golder Associates (Golder Technical Memorandum, August 3, 2005), listening to citizen comments at the public hearing, talking with the Duwamish River Cleanup Coalition, discussions with our own technical advisors, and lengthy discussions amongst ourselves, we have come to the decision that we cannot support the Port's preferred alternative at T-4. | Please see the response to Comment 12-1 . |
| 74 | 2 | In our view there are too many questions about the long-term impacts of this project. The CAG feels strongly that this proposal is not protective of public health and the environment and that the unresolved issues preclude the use of the CDF as a remedial action at T-4. | <p>EPA has noted your objections to this project. As discussed in Section 8 of the EE/CA, factors evaluated for long-term risk can generally be divided into two categories and include: 1) the adequacy and reliability of the action to achieve the RAOs, and 2) the potential risk of the action relative to other alternatives. As described in the EE/CA, the preferred alternative includes approximately 76% of the removal action area to be either capped or dredged. This will achieve permanent isolation of contaminated sediments and reveal a sediment surface within acceptable concentrations. Monitored natural recovery (MNR) will be applied to the remaining areas, which is expected to achieve permanent reduction of contaminants to acceptable levels within 5 years. Therefore, EPA believes that the selected alternative will achieve the RAOs, is a permanent solution, and is both adequate and reliable. The other factor EPA considered is the risk of the action compared to the other alternatives. In this case, long-term risk generally includes situations which could impact the integrity of the CDF, such as earthquakes and floods. While earthquakes and floods were considered (see response to Golder Comments), the review conducted by EPA indicates that the integrity of the CDF will not be compromised. The long-term risk associated with this action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA section 8). Therefore, the action does not significantly increase the long-term risk compared to other alternatives and benefits of the preferred alternative (see response to Comment 1-1), outweigh any potential long-term risk associated with it.</p> <p>In addition, it should be noted that the location of Slip 1 to be used as a CDF was considered as part of the EE/CA. The availability of Slip 1 within the removal action area, its current configuration, the proximity to other Portland Harbor sites, and location to transport of sediments were all factors in selecting the location of the CDF in Slip 1. In addition, the use of Slip 1 as a CDF also contributes to long-term protection by eliminating the potential for recontamination because the Slip 1 sediment area will be eliminated.</p> <p>Also see response to Comment 75-4.</p> |
| 74 | 3 | Specifically, we have concerns about the viability of the proposed facility in both earthquake and flood conditions and many questions about the long-term ecological and human health impacts. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-3 , 2-6 , 2-8 , and 5-2 . Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments. |
| 74 | 4 | This CDF, as the Port has pointed out, is a landfill operation and, as such, must meet Federal and State regulations for landfills. These include detailed studies of active faults within 3000 feet of the CDF site; locating no closer than 200 feet of an active fault (defined as movement within the last 10,000 years) for solid waste, and 1,320 | The CDF is not a landfill as defined under federal solid or hazardous waste regulations. Relevant State of Oregon landfill regulations were determined not to be ARARs for the Terminal 4 CDF as they are equal to federal requirements under CERCLA and the Clean Water Act. Significant analysis and consideration was conducted on earthquake consequences related to the CDF. |

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| | | <p>feet if the waste is classified as hazardous; the CDF must be designed for a maximum horizontal acceleration with a 2,475-year return period. The report from Golder Associates suggests that adequate analysis of the risks from earthquake has not been done and that compliance with applicable Federal and State laws for landfills in earthquake zones will ultimately not be achievable.</p> <p>The Port's consultant, BBL, ignored the potential for liquefaction of the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm. The Golder analysis predicts that approximately 30 feet of alluvial soil is anticipated to liquefy at the toe of the CDF berm and that approximately 20 feet of alluvial soil is also anticipated to liquefy beneath the berm during a CLE earthquake. Risks of this nature are unacceptable to the public and relying on an engineering fix after federal approval skirts applicable laws and would require further public comment.</p> | Please see responses to Golder Comments 1, 2, 3, 5, and 6 . |
| 74 | 5 | The conceptual design for the berm does not address potential erosion or scour along the river side toe of the berm during peak flood events. Regulatory requirements for disposal of contaminated materials in floodplains state that a proposed facility cannot "expand or modify a landfill in a floodplain in a manner that will allow the facility to result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources." The proposed CDF design does not adequately address this criterion with respect to provisions for bank erosion from the dynamic movement of the river or scour. It also does not address erosion along the toe of the berm during peak flows or in the event of an earthquake. | Please see response to Comment 84-3 . |
| 74 | 6 | A section on recontamination/re-suspension is missing from the report. The impacts of deposition and erosion along the river and the impact on dredging, capping, the CDF berm, and natural attenuation should be given significantly more discussion and consideration. | The recontamination analysis will be completed just prior to the initiation of cleanup. The EE/CA provides preliminary discussion of recontamination/re-suspension and the impacts of deposition and erosion along the river and what the impacts of dredging, capping, and natural attenuation are. The EE/CA notes where additional data related to sediment re-suspension and deposition within the Removal Action Area are being collected as part of the ongoing post-Removal Action recontamination analysis. For example, within Appendix D – Summary of Hydrogeological Characteristics information was provided and evaluated with respect to contaminant transport aspects of the Removal Action Alternatives and Appendix G – Summary of Hydraulics and Sedimentation Characteristics presented data on sediment deposition. |
| 74 | 7 | In summary, this proposal for a confined disposal facility in the Willamette River is not rigorous enough in design to provide adequate assurances to the public that it will withstand both earthquake and potential flood events. Furthermore, additional questions remain in regard to this site's projected lifetime and the level of monitoring and maintenance that would be required. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments. In addition, EPA will require post-removal action monitoring to ensure that the CDF is meeting intended performance criteria. The preliminary design of the CDF includes monitoring for a period of 30 years. Please see the response to Comments 1-1, 2-6, 2-8 and Golder Comments . |
| 74 | 8 | Even if it were redesigned to be more protective, the CAG feels that there are too many uncertainties associated with the immediate and long-term impacts of this proposed facility which would be the first of its kind to be built in a river. | Thank you for your input. EPA believes the analysis presented in the EE/CA addresses many of the uncertainties. CDFs and other in-water confined disposal facilities have been successfully designed and used and is not unproven. |
| 74 | 9 | In discussing alternatives to the CDF that will provide a timely and thorough clean up, the CAG feels that a variety of methods should be | Please see the response to Comment 1-2 for the explanation of how the Terminal 4 EE/CA evaluated the |

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| | | used. We urge EPA to continue to seek alternative technologies that could be used for the whole project and possibly combined with other CERCLA cleanups in the Northwest. In our view, it makes most sense to remove these sediments from the river, treat them if possible and then, depending on remaining contamination levels either dispose of them in an upland landfill or reuse them for some other purpose. | feasibility of treatment technologies. |
| 74 | 10 | We also support capping and natural recovery where appropriate. | Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment under appropriate circumstances. The preferred alternative utilizes both of these technologies as components of the action. |
| 74 | 11 | The CAG also wanted to convey their strong desire to have hydraulic dredges used to minimize the level of re-suspension. | Discussion of hydraulic dredging can be found in Appendix J of the EE/CA. Hydraulic dredging is desirable in placing materials in the CDF and we agree it will be useful to reduce resuspension and possible migration beyond the removal action area. Hydraulic dredging will be further evaluated during the design phase of the project. |
| 75 | 1 | Waste Management Disposal Services of Oregon, Inc. and Chemical Waste Management, Inc. (collectively "Waste Management") appreciate the opportunity to submit the following comments on the above-referenced EE/CA Report. In Oregon, Waste Management owns and operates three solid waste landfills and one hazardous waste landfill. The company not only manages and disposes of municipal solid waste, it also manages significant quantities of materials from contaminated site cleanups, including contaminated sediments and soils. We are therefore keenly interested in decisions made concerning remediation alternatives for these kinds of cleanups. | Thank you for your input. |
| 75 | 2 | While Waste Management would typically not comment on environmental cleanup documents at a site not directly involving Waste Management, we are very concerned with the Terminal 4 EE/CA Report because of the unwarranted and unsupported negative evaluation of upland landfill disposal as an appropriate and effective cleanup alternative for the Terminal 4 project. The Terminal 4 Early Action EE/CA Report is proposing what can best be characterized as an unpermitted, unlined solid waste landfill with excess capacity that will compete against permitted landfills for third party waste volumes. | <p>Off-site disposal was considered in the EE/CA as a viable and effective disposal alternative. However, based on the overall evaluation of the alternatives, the CDF alternative was selected for the Terminal 4 removal action. See response to <u>Comments 1-1, 74-2, 75-4, and 75-6</u> regarding evaluation of the alternatives and long-term risks.</p> <p>Federal solid waste landfill requirements are not applicable or relevant to disposal of contaminated dredged sediment in an on-site confined disposal facility. Relevant State of Oregon solid waste regulations were determined not to require more than the requirements imposed by CERCLA and the Clean Water Act. Please see the response to <u>Golder Comment 1</u>.</p> <p>Only dredged sediment that are appropriate for in-water disposal (i.e. low leaching potential) from the Terminal 4 site will be allowed in the CDF. Future cleanup decisions will need to determine whether the CDF is an appropriate disposal option for contaminated sediment from other locations. Based on data taken as part of the Portland Harbor investigation and DEQ's upland source control work, there are areas of sediment contamination in the river that have such high concentrations and/or are highly leachable, or otherwise not safe for in-water disposal.</p> |
| 75 | 3 | Waste Management and other Northwest landfill operators have invested substantial money and resources into the development, permitting, construction, and operation of landfill facilities that are fully compliant with local, state, and federal environmental and regulatory requirements. Waste Management firmly believes that the disposal of contaminated sediments at lined, fully-permitted, and highly-regulated landfills is a superior environmental cleanup alternative to the preferred confined disposal facility ("CDF") alternative advocated in the EE/CA Report. | See response to <u>Comment 75-2</u> , as well as <u>Comments 1-1, 2-3, and 5-2</u> . |

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| 75 | 4 | The EE/CA report has used a comparative analysis matrix that is based on unsupported and unexplained assumptions, uses an overly-simplistic ranking scheme, and – we believe – unfairly skews the conclusions toward the CDF alternative. The result would be the selection of a preferred cleanup alternative that unfairly competes against landfills that have made significant investments in fully-permitted and heavily-regulated facilities. Accordingly, Waste Management submits that the EE/CA Report's evaluation and comparison of different cleanup alternatives is flawed and should be re-done. | <p>See response to <u>Comment 75-2</u>.</p> <p>Removal Action Alternatives, both individually and comparatively, were evaluated with respect to nine CERCLA non-time critical removal action evaluation criteria. The evaluation criteria fall into three categories: threshold criteria, balancing criteria, and modifying criteria (USEPA 1993). An alternative must meet the threshold criteria (overall protection of human health and the environmental compliance with ARARs) before it can be considered as the Preferred Alternative. The balancing criteria are effectiveness, implementability, and cost; while modifying criteria include State and community acceptance evaluated by USEPA after the public comment period. Following the individual evaluation, alternatives were comparatively evaluated using the following procedures:</p> <ul style="list-style-type: none"> • Alternative 1 (No Action) and Alternatives A, B, C, and D were compared against each other in turn for their ability to meet the individual evaluation criterion that made up the broader categories of effectiveness, implementability, and costs (i.e., balancing criteria), • For each criterion, a qualitative comparison was made between the two alternatives considered. A value of +1 was assigned to the alternative considered more favorable in terms of its relative performance at meeting the requirements of the criterion. A value of -1 was assigned to the alternative considered less favorable in terms of its relative performance, and • If the two alternatives being compared were deemed equal in their ability to meet the requirement of a criterion, both alternatives were assigned a value of zero. <p>The criterion evaluated included:</p> <ol style="list-style-type: none"> 1. Overall protection of public health and the environment, 2. Compliance with ARARs, 3. Short-term effectiveness, 4. Reduction of volume, mobility, and toxicity of contaminants through treatment, 5. Long-term effectiveness, 6. Technical feasibility, 7. Administrative feasibility, 8. Availability, and 9. Cost. <p>Specific detail regarding the comparison of each alternative against one another is discussed in Section 8.6 of the EE/CA and explains why one alternative is ranked higher than another. Table 8-2 shows the results of the comparison. EPA believes that the comparison of alternatives was completed unbiased and does not result in a preference against upland disposal. However, when considering the positive aspects of a CDF, primarily due to the proximity of the facility to Terminal 4, including less amount of handling and transport of contaminated sediments, less potential recontamination, least disruption of tenant activities, and least amount of community impacts, against off-site disposal, Alternative C was ranked the highest reflecting its greatest overall relative performance in meeting the requirements of the aforementioned evaluation criteria.</p> <p>Although upland disposal is considered a viable disposal option for future consideration, the potential impacts on the community and Port operations, primarily due to large handling and transportation impacts, as well as the location of Slip 1 as suitable for on-site disposal with the added potential to facilitate the long-term remedial action at Portland Harbor, indicated that the CDF alternative proved to be better suited for Terminal 4 sediment.</p> |
| 75 | 5 | When a revised EE/CA report is completed, we expect that the upland disposal option will be proven to be the most environmentally protective, technically feasible, and cost-effective alternative. Our specific comments follow. | Thank you for your input. |
| 75 | 6 | The Comparative Analysis matrix contains unsupported and suspect | The NTCRA guidance (USEPA, 1993) requires a comparative analysis of removal action alternatives to |

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| | | <p>assumptions.</p> <p>We have serious concerns with the use of the "Comparative Analysis" because the implicit assumptions underlying the calculations are not supported or even explained. We believe that the outcome of the Comparative Analysis itself belies its efficacy. In other words, it just does not make sense that Alternative D – dredge with landfill disposal – ranks fourth of four alternatives in the final calculations.</p> <p>For example, there is no explanation how it is decided that certain alternatives are considered to be equivalent enough to both receive "0s" and others are different enough to receive a +1 and -1. For instance, Alternative C is scored as a +1 against Alternative B's -1 based on purportedly superior and suspect long-term effectiveness. In contrast, these two alternatives are scored as equivalent in terms of cost in spite of Alternative C costing 25% more. At what point are two alternatives different enough to warrant scores of +1 and -1? At what point are they similar enough to be scored the same? Without such guidelines, the scoring of different alternatives is susceptible to unverifiable and unstated subjective judgments.</p> | <p>identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect the remedy selection can be identified. The guidance does not prescribe a specific method for the execution of comparative analysis of removal action alternatives. EPA used a comparative method that would highlight the benefits and disadvantages between alternatives which contain common elements. Explanations of the comparisons are provided in Section 8.6 of the EE/CA.</p> <p>The NTCRA guidance (USEPA, 1993) does not apply weightings to the three main evaluation criteria. Neither does other similar guidance documents, including the underlying RI/FS manual, or the Superfund Accelerated Cleanup Model, and ultimately the NCP does not apply weighting to the fundamental non-time critical removal action three criteria: effectiveness, implementability and cost. Thus, it is general practice and not inconsistent with the NCP and all subsequent guidance manuals, specifically the NTCRA guidance, that these three criteria are applied at equal weight.</p> <p>For each criterion, a qualitative comparison was made between the two alternatives considered. A value of +1 was assigned to the alternative considered more favorable in terms of its relative performance at meeting the requirements of the criterion. A value of -1 was assigned to the alternative considered less favorable in terms of its relative performance, and if the two alternatives being compared were deemed equal in their ability to meet the requirement of a criterion, both alternatives were assigned a value of zero. This method is consistent with methods used for other RODs and EE/CAs and is consistent with NTCRA guidance.</p> <p>Direct comparison of Alternative C with Alternative D shows how the Preferred Alternative ranks higher. For example, Alternative C is given a value of 1 over Alternative D for the criteria Overall Protection of Public Health, Short-Term Effectiveness, and Long-Term Effectiveness. Some of the reasons for the preference for Alternative C in the rankings include: 1) the amount of handling and transport of contaminated material is significantly minimized over Alternative D, 2) impact on the community is expected to be less since all construction activities associated with implementation of Alternative C is confined to the Terminal 4 facility (as opposed to transporting significant contaminated sediment off-site for Alternative D), 3) the short-term risk of recontamination is minimized during implementation because a relatively small volume of sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the river, and 4) the long-term risk of recontamination is reduced because it eliminates the Slip 1 area (as opposed to Alternative D).</p> <p>Please note that because the estimated cost for each of the alternatives are within 20 percent and within the uncertainty of the cost, the comparison of cost is equal between alternatives.</p> |
| 75 | 7 | Also, there is no subtlety in comparing alternatives. Either two alternatives are equivalent or they are not. There is no recognition that one alternative might be only slightly better than another in one category, and substantially worse in another. It is arbitrary to use such a simplistic means of evaluating alternatives. | See response to Comment 75-6 . |
| 75 | 8 | Likewise, there is also no justification for the implicit decision that each of the three categories of EE/CA factors (effectiveness, implementability, and cost) are to be weighted equally in the final ranking of alternatives. That decision alone – unsupported as it is – can result in a substantial skewing of the results toward one alternative or another. | The comparative techniques for evaluating alternatives determined to be most suitable for Terminal 4 is described in Section 8.6 of the EE/CA. See response to Comment 75-6 . |
| 75 | 9 | <p>The Comparative Analysis yields arbitrary and illogical results.</p> <p>Any comparative analysis of different removal action alternatives is</p> | The comparative analysis technique is described in Section 8 of the Terminal 4 EE/CA. In this evaluation technique, two alternatives are compared at a time, so that it is evident, which one rates higher. This technique is applied to all pairings of alternatives to provide the least subjective method of comparing |

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| | | inherently a subjective exercise. While there may be some utility in adopting a quasi-quantitative approach for ranking different alternatives, mathematical manipulation should not be considered a substitute for professional judgment. In the case of this Comparative Analysis, the methodology chosen – assigning a 1, 0, or -1 to each alternative – is especially vulnerable to error because an alternative that is only marginally less protective than another will score the same as a third alternative that utterly fails to provide any environmental protection at all. Thus, for example, in this Comparative Analysis, Alternative D and the No-Action Alternative score identically for overall protectiveness when compared with Alternative C, yet it is inconceivable that an upland landfill disposal alternative would be consider no more protective than the no action alternative. | removal action alternatives. Consistent with the NTCRA guidance and the NCP, equal weight is applied to the three evaluation criteria of effectiveness, implementability and cost (the weight of the primary criteria was divided equally amongst the subcriteria to achieve a one-third weighting). | | | | | | | | | | | | | | | | | | |
| 75 | 10 | <p>In deriving the final score and ranking for each alternative in the Comparative Analysis, the nine factors are given substantially different weightings, without explanation why. Those weightings are:</p> <table><tr><td>Overall protection</td><td>6.7%</td></tr><tr><td>Compliance with ARARs</td><td>6.7%</td></tr><tr><td>Short-term effectiveness</td><td>6.7%</td></tr><tr><td>Reduction of volume, etc.</td><td>6.7%</td></tr><tr><td>Long-term effectiveness</td><td>6.7%</td></tr><tr><td>Technical feasibility</td><td>11.1%</td></tr><tr><td>Administrative feasibility</td><td>11.1%</td></tr><tr><td>Availability</td><td>11.1%</td></tr><tr><td>Cost</td><td>33.3%</td></tr></table> <p>This weighting scheme can cause significant distortions in the final rankings of alternatives, yet without any explanation why. For example, cost is given five times greater weight than overall protection, yet without explanation</p> | Overall protection | 6.7% | Compliance with ARARs | 6.7% | Short-term effectiveness | 6.7% | Reduction of volume, etc. | 6.7% | Long-term effectiveness | 6.7% | Technical feasibility | 11.1% | Administrative feasibility | 11.1% | Availability | 11.1% | Cost | 33.3% | Please see response to Comments 75-6 and 75-9 . |
| Overall protection | 6.7% | | | | | | | | | | | | | | | | | | | | |
| Compliance with ARARs | 6.7% | | | | | | | | | | | | | | | | | | | | |
| Short-term effectiveness | 6.7% | | | | | | | | | | | | | | | | | | | | |
| Reduction of volume, etc. | 6.7% | | | | | | | | | | | | | | | | | | | | |
| Long-term effectiveness | 6.7% | | | | | | | | | | | | | | | | | | | | |
| Technical feasibility | 11.1% | | | | | | | | | | | | | | | | | | | | |
| Administrative feasibility | 11.1% | | | | | | | | | | | | | | | | | | | | |
| Availability | 11.1% | | | | | | | | | | | | | | | | | | | | |
| Cost | 33.3% | | | | | | | | | | | | | | | | | | | | |
| 75 | 11 | <p>Upland disposal of contaminated sediments is generally considered to be more environmentally protective overall than in-water or CDF disposal options.</p> <p>Landfill owners have invested millions of dollars and years of work in designing, permitting, constructing and operating RCRA Subtitle D-compliant landfills. Modern landfills have state-of-the-art liners, sophisticated leachate collection and stormwater runoff systems, extensive groundwater and air emissions monitoring systems, significant financial assurance requirements, full-time professional staff, and extensive regulatory oversight. Moreover, a number of landfills in the region have significant geological, geographic, and climatic advantages over a CDF constructed in Portland Harbor.</p> | <p>The Terminal 4 alternatives were evaluated on site and project specific conditions and parameters.</p> <p>Also see response to Golder Comment 1 describing the fundamental differences between CDFs intended for the placement of contaminated sediment (with their unique chemical physical characteristics) and upland landfills which are intended for a completely different set of conditions, waste streams and chemical, physical conditions.</p> | | | | | | | | | | | | | | | | | | |
| 75 | 12 | We strongly disagree with the EE/CA's conclusion that the CDF | Please see response to Golder Comment and Comment 75-4 and 75-11 . | | | | | | | | | | | | | | | | | | |

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| | | <p>disposal option is viewed as more environmentally protective overall than landfill disposal. It is not credible to suggest that the in-water, unlined CDF option has greater overall protectiveness than modern landfills. Not only is the setting of the CDF (in-water) inferior to disposal in arid, upland landfills, the CDF lacks the important engineering and environmental controls associated with modern landfills.</p> <p>Notwithstanding the clear benefits of landfill disposal, the EE/CA concludes that of the four alternatives the landfill disposal alternative has the least overall protectiveness. This is not a credible conclusion.</p> | |
| 75 | 13 | <p>Landfill disposal of contaminated sediments should rank higher for long-term effectiveness than CDF disposal.</p> <p>For the same reasons given above, we strongly question the conclusion that CDF disposal of contaminated sediments in an unlined, in-water CDF is considered to rank higher in terms of long-term effectiveness than a disposal option that includes a fully-permitted, lined, Subtitle D-compliant landfill. Modern landfills are designed to meet the strict regulatory requirements of Subtitle D in order to ensure long-term effectiveness. A CDF option that does not meet these same regulatory requirements would logically have less long-term effectiveness.</p> | See response to <u>Comment 75-11</u> above and response to <u>Golder Comment 1</u> . Please see response to <u>Comment 74-2</u> for long-term effectiveness evaluation. |
| 75 | 14 | <p>Landfill disposal is readily available.</p> <p>The Comparative Analysis also concludes that Alternative D is least favorable based on availability because "it relies most heavily on the availability and coordination of personnel, equipment, materials, transportation modes, and off-site TSD facilities." This rationale does not make sense. While off-site transportation and disposal obviously will require coordination, means of transport, and facilities for disposal, there is no basis to conclude that these elements are unavailable or less available than the resources required for the CDF alternative.</p> | <p>The EE/CA, in Section 8 and Appendix Q, correctly states that the CDF alternative relies less on outside resources such as hauling, transport and disposal. The permit to two Northwest landfills to accept "wet" waste is temporary and has certain volume/tonnage acceptance land time limits. These limits represent some constraints which impact the availability of landfill disposal.</p> <p>Since there are a number of other contaminated sediment projects in the Northwest which may utilize these landfills, it has to be taken into account whether and if these projects would occur at the same time as the Terminal 4 removal action representing an availability concern for hauling, transport and disposal.</p> <p>Further, haul capacity is also impacted by other, non-contaminated sediment management related issues, for example major land development, dam construction, highway construction and other projects which may tie up available transport capacity impacting the availability and cost of such services. Each additional step in a process adds complexity and opens up the potential for delays.</p> <p>See Section 8, Appendix B, Appendix J, and Appendix Q - Section Q-5 for more detailed information regarding availability and feasibility.</p> |
| 75 | 15 | <p>CDF disposal does not satisfy ARARs.</p> <p>Under Oregon regulations, contaminated sediments from a Superfund cleanup are considered "cleanup materials contaminated with hazardous substances." OAR 340-093-0030(14); OAR 340-093-0170. If disposal is determined to be the appropriate management strategy, then Oregon regulations and CERCLA require disposal at a landfill that meets the substantive design requirements of 40 CFR Part 258, Subpart D or an approved alternate design that satisfies specific performance criteria. OAR 340-093-0170(3)(a). While the</p> | <p>See response to <u>Golder Comment 1</u>. The federal solid waste landfill regulations are not applicable or relevant and appropriate requirements for the Terminal 4 removal action.</p> <p>The applicability of OAR 340-093-0170 "Cleanup Materials Contaminated with Hazardous Substances" is dependant on the definition of "site". OAR 340-093-0170 (1)(b) states that OAR 340-093-0170 does not apply if the materials containing the hazardous substances are not moved from the "site of contamination". Considering the definition as cited in the EE/CA report of "onsite" as "the aerial extent of contamination and all suitable areas in very close proximity to the contaminates necessary for implementation of the response action" the proposed CDF is within the boundary of the Terminal 4 site thus, OAR 340-093-0170 would not apply. Therefore, under that Oregon regulation, the dredge sediment would not be required to be disposed</p> |

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| | | <p>EE/CA asserts that CDF disposal will comply with ARARs, it does not explain how, especially given that the CDF is an unlined facility that obviously does not meet the Part 258 standards or the alternate performance criteria.</p> <p>Likewise, we also question the conclusion in the Comparative Analysis that CDF disposal is considered equivalent to landfill disposal in terms of ARARs compliance. If the CDF neither meets the requirements of 40 CFR Part 258 nor the alternate performance criteria, then it does not meet ARARs and cannot be considered equivalent to Alternative D in terms of ARARs compliance. It is also not explained how the CDF disposal option will meet other ARARs, such as ARARs based on Section 404 permit requirements of the Corps of Engineers or Clean Water Act water quality standards. Instead, the EE/CA simply presumes that CDF disposal will – and must – comply with all ARARs. Thus, based on this untested and unsupported assumption, the EE/CA report scores the CDF option (with questionable ARARs compliance) as equivalent to an upland disposal option that would easily achieve ARARs compliance.</p> | <p>of in a facility meeting the design requirements of 40 CFR 258.</p> <p>The Oregon Department of Environmental Quality (“DEQ”) evaluated the question of state solid waste regulations as applicable or relevant and appropriate requirements for the CDF. DEQ concluded that certain portions of the state solid waste regulations are relevant and the proposed removal action already incorporates many of them. In addition, DEQ concluded that certain portions of other relevant state solid waste regulations will be imposed on the Terminal 4 Removal Action during design and implementation, such as:</p> <ul style="list-style-type: none"> • Construction Certification • Operation Plan • Monitoring Discharge to the River • Closure Plan • Site Monitoring • Develop Financial Assurance <p>Therefore, since the potentially relevant and appropriate state solid waste regulations are not more stringent than federal law requirements, state solid waste regulations are not considered ARARs for the Terminal 4 CDF.</p> <p>In summary, 40 CFR Part 258 does not include applicable or relevant and appropriate requirements for the CDF. The CDF will be designed and constructed to meet the substantive requirements of the CWA, which is the governing ARAR for the discharge of dredged material to navigable waters of the United States.</p> <p>Section 6 of the EE/CA contained a list of the potential ARARs for the removal action that included a description of the requirement and generally when it would relate to the removal action. A final ARARs list is attached to the Action Memo.</p> <p>The EE/CA also contained additional information relating to a few of the more significant ARARs. Permit requirements contained in Section 404 of the Clean Water Act are not ARARs for the Terminal 4 removal action because they are procedural and CERCLA response actions taken on-site are exempt from permit requirements of federal, state, or local law. See 42 USC Section 9621(e). The substantive requirements of Section 404, namely Section 404(b)(1) and its implementing regulations, are ARARs. The Port prepared a preliminary Section 404(b)(1) analysis on the preferred alternative, attached as Appendix Q to the EE/CA. The 404(b)(1) requirements will be further incorporated into the Terminal 4 action as the design phase of the project proceeds, including adequate mitigation necessary to offset unavoidable loss of habitat from the removal action. Another ARAR for this action is the Endangered Species Act. The Port also prepared an initial Biological Assessment on the preferred alternative, Appendix P to the EE/CA and consultation has been initiated with the appropriate resource agencies. Further ESA analysis and consultation deemed necessary will proceed throughout the design and implementation of the removal action. A certification equivalent to the substantive requirements of Section 401 of the Clean Water Act will be undertaken to evaluate what conditions, measures and monitoring will be required to reasonably assure that water quality standards will be met throughout the implementation of the removal action. It is not speculative to assert that ARARs will be complied with to the extent practicable; as such requirements become operating standards for the project consistent with CERCLA and the NCP. Additionally, other dredge and fill projects of contaminated sediment have been conducted under CERCLA authorities and compliance with the typical ARARs for such actions has been met at those projects.</p> |
| 75 | 16 | The Comparative Analysis should not include credit for excess disposal capacity in its cost comparison. | NCP guidance requires EPA to evaluate the overall cost of alternatives, including any savings or other cost offsets a PRP may create to reduce the overall cost of a removal action. |

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| | | <p>We also disagree with the assertion that the cost of the CDF should be reduced based on the anticipated revenues to be collected for the disposal of other contaminated sediments from nearby cleanups. The EE/CA should not be viewed as an opportunity to develop additional unpermitted disposal capacity without undertaking the extensive and lengthy regulatory evaluation with numerous opportunities for public comment that Subtitle D landfill owners and operators are required to pursue. It is fundamentally unfair to circumvent the extensive regulatory review process for and the huge investment of money and resources into the development and operation of Subtitle D landfills. To do so would only further exacerbate the inequitable competitive advantage given to a CDF disposal over Subtitle D landfills.</p> <p>Furthermore, the assumed \$10 million cost benefit assumption is flawed in that the anticipated volume which is needed is neither yet defined (RI/FS not completed) or committed to the Terminal 4 CDF. EPA should not assume that such volumes exists, and even if it does, that third parties involved in other cleanups will be willing to send material to the CDF due to environmental liability or financial issues. This assumption also presents a significant financial risk to the tax-paying public if this assumption proves incorrect.</p> | <p>Construction of a CDF as part of the Terminal 4 removal action comes with no obligation or guarantee to use the facility as a disposal site for contaminated sediments from other dredging projects in the Portland Harbor Superfund Site. However, an existing CDF will create an on-site sediment disposal option for consideration if the project involves suitable dredged material for in-water disposal.</p> <p>CERCLA provides and allows for the substantive compliance but not procedural compliance with otherwise applicable federal and state laws that may otherwise apply to a project undertaken under another statute or authority. The CERCLA statutory scheme was determined by Congress to be necessary and appropriate in order to effectuate the remedial purpose of the statute and minimize delays in implementing cleanups. Nonetheless, as discussed above, Subtitle D regulatory requirements would not be applicable to siting, designing, or constructing the CDF.</p> <p>Appendix Q provides more detailed analysis of the needs of the Portland Harbor Superfund Site as it relates to the CDF's excess capacity. This evaluation of future needs of the Superfund Site in the context of the removal action alternatives evaluation is consistent with NTCRA Guidance (EPA 1993 at 41) and Section 104(a)(2) of CERCLA.</p> |
| 75 | 17 | Based on the above, Waste Management obviously is very concerned with how the EE/CA Report has compared different cleanup alternatives. In particular, we are very concerned with how the upland landfill disposal option has been evaluated. We know that you will consider these comments carefully and look forward to your response. | Thank you for your input. See above responses for comparison of alternatives, include upland disposal. It should be noted that the selection of the CDF does not bias EPA's future decisions. Although the CDF may be an additional disposal option to consider in future cleanup decisions, whether or not the CDF will be determined to be appropriate for the sediment being dredged and/or a protective alternative will need to be evaluated and a decision related to that cleanup will be made. Having an on-site disposal facility may generate more interest by other facility owners to address contamination at their sites sooner, if they believe that the CDF may be more efficient, implementable or cost-effective. However, EPA's review of such a proposal will need to consider the protectiveness of disposal in the CDF compared to other cleanup approaches or disposal options. |
| 76 | 1 | As recommended by our board and ratified by a vote of our general membership, FOCP advocates clean-up of Terminal 4 using Alternative D (Dredging Emphasis with Upland Landfill Disposal). However, our recommendation is contingent on two further requirements: | Thank you for expressing your preference. EPA has selected Alternative C due to a number of evaluation criteria. Please see responses to Comments 1-1, 2-3, and 75-4 . Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments. |
| 76 | 2 | FOCP advocates hydraulic dredging as the removal technology for extracting sediments from the indicated slips. | Hydraulic dredging is an attractive option for collecting and transporting contaminated sediments from Slip 1 into the CDF and will be considered during the design of the Removal Action. |
| 76 | 3 | FOCP advocates the transfer of dredged material directly to rail-based transport for final removal from the terminal area. | Please see response to Comment 1-1 . |
| 76 | 4 | In recommending landfill disposal, our association gives greatest weight to this standard: which of the alternatives will provide the most complete and permanent solution to the problem of durable toxic sediments located in an urban area with a growing population? While each of the options presented by the Port promises to contain the lingering toxic sediments, Alternative D comes closest to the ideal outcome of permanently removing the waste from a densely populated urban environment such as N. Portland. | Please see response to Comment 1-1 . |
| 76 | 5 | The option recommended by the Port's engineering consultants (Alternative C, Dredging Emphasis with Confined Disposal Facility) provides cost benefits to the Port and minimizes some kinds of risks, | Please see the responses to Comment 2-6 and the Golder Comments . |

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| | | but it does not provide a high enough guarantee of long-term protection from such threats as water-table contamination and earthquake damage, especially in the context of an Early Action recommendation. | |
| 76 | 6 | If adopted, its implementation will leave residents of N. Portland with lingering doubts about ultimate safety and integrity of the CDF for decades to come. Meanwhile, the successful completion of Alternative D (with FOCP's proposed revisions) provides a long-term solution that will not require second-guessing by future generations of Portland residents. | Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see the response to Comment 1-1 and 74-2 . |
| 77 | 1 | I am writing this letter in opposition of building a Contained Disposal Facility in the Port of Portland's marine terminal 4 on the Willamette River. | EPA has noted your preference. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. |
| 77 | 2 | I believe this plan is far too risky and will not resolve the contamination issues at all, but only serve to further complicate them. The proposed Confined Disposal Facility lies between two earthquake faults and on a flood plain that has actually flooded three times in the last 60 years. | Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA has carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see the responses to Comment 2-6 , Comment 2-8 and the Golder comments . |
| 77 | 3 | The CDF is too close to housing and business near the harbor. If either of the above mentioned natural hazards [earthquake or flood] were to occur the contamination would pose serious health risks to the neighborhood. | Please see response to Comment 2-2 . |
| 77 | 4 | On top of these serious concerns we have to add the terrible and on-going history criminal malfeasance of the Port of Portland in managing their waste issues. The Port is not a waste management facility. How can we trust them to manage this project for the next 500 years? | EPA, several state agencies, tribes and natural resource trustees provide oversight for cleanup projects to make sure that the proposed actions are properly designed, implemented and monitored. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup and the Port of Portland is responsible for the cost of evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. As a requirement of the legal agreement EPA has with the Port, the Port must provide financial assurances to prove that it can meet its cleanup obligations. |
| 77 | 5 | The waste should be shipped away from the concentration of people here in Portland and stored in a licensed landfill for saner and safer long-term solution. | EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 . |
| 78 | 1 | I am writing to express my concern over the proposed method of dealing with the Portland Harbor Superfund Site. I applaud the fact that the government wants the site cleaned up, but feel it is imperative for the safety of future generations and us that the cleanup is done correctly. I have been a citizen of Portland for ten and half years, and one of the reasons I chose to make Portland home was the beautiful river running through our city. Our state, and especially the city of Portland, is known for its progressive thinking and environmental consciousness. As a City Planner, I know we have one of the most livable metropolitan areas in the United States. It is sad that we have a toxic superfund site located in the heart of the city. | EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. |
| 78 | 2 | I believe that dredging the toxic waste, placing it in a capped Slip, and leaving in the river is not the best manner of dealing with the issue. | Please see response to Comment 1-1 . |
| 78 | 3 | The Confined Disposal Facility (CDF) is just too dangerous to our community. | EPA included a CDF in the EE/CA alternatives because it is a safe and protective method for disposing of contaminated sediments. |
| 78 | 4 | It is true that CDF may be a less expensive in the short term to contain the waste, but the cost to our communities, our children and the health of the Willamette River in the event of containment failure | The CDF alternative was not significantly cheaper than other alternatives evaluated. See response to Comment 2-2 and 2-3 . |

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| | | is too high. | |
| 78 | 5 | My main concern is what might happen in the event of a flood, or earthquake, both of which are likely events to occur in our area. I was in Portland during the major Willamette River floods in the winter of 1996. We all know the history of our area and the likelihood of a major earthquake. I am concerned about the failure of the CDF when such events occur in the future. | Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see the response to Comment 2-6 , Comment 2-8 and the Golder Comments . |
| 78 | 6 | As a member of the Sierra Club, I have been working on issues involving the clean up of the Willamette River. I am gravely concerned that the CDF proposal will not improve the river quality in the long term and will only result in even more money being spent. I would like to see us be leaders in the cleanup of our Superfund Site and do the job right the first time. | Please see the response to Comment 1-1 . EPA has carefully reviewed the EE/CAs analysis. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments. |
| 79 | 1 | I am dismayed to learn of the Port of Portland's inadequate plans to clean up toxic pollution in the Willamette Harbor. Specifically, I am writing concerning the plan to build a containment area for toxic waste along the river rather than removing the waste. | Sediment disposed in the CDF is not a hazardous waste. Please see response to Comment 1-1 . |
| 79 | 2 | The fact that the area was designated a "Superfund Site" indicates that the pollution in the harbor is no small matter and it would just continue the tragedy to fail to address the issue fully when we now have the chance. | The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Other local, state and federal agencies have and will continue to undertake additional efforts to ensure the Willamette River is clean for future generations. |
| 79 | 3 | The toxic waste in the harbor should be removed to a site where it will be safe for future generations. | Please see response to Comment 1-1 . |
| 79 | 4 | Building a "Confined Disposal Facility" next to the river seems ludicrous. It is easy to imagine toxins leaching out, runoff and flooding disturbing the containment, earthquakes, or other failures which would simply require the process to be started again, at substantial cost to both the environment and taxpayers. | Please see responses to Comments 2-6 and 2-8 for earthquake and flooding issues and Comments 2-3 and 5-2 for long-term safety and leaching issues. |
| 79 | 5 | You have the opportunity and technology to actually clean the harbor and the waste should be removed from the river area, probably to Arlington where it can be effectively dealt with. | Please see response to Comment 1-1 . |
| 79 | 6 | Dumping the dredgings into a hole beside the Willamette may be a less expensive solution at the moment, but it is not the right one. Please let the long term health of the environment and Portlanders guide you foremost, not money. | Placing selected low-level sediment in a carefully designed CDF is not the same as dumping it in a hole. Please see response to Comments 1-1 , 2-3 , and 5-2 . |
| 79 | 7 | We have the opportunity to once again clean a bit of the Willamette, but we must do it in a manner which will actually solve the problem and not leave it to future generations to deal with again. | Please see response to Comment 1-1 . |
| 79 | 8 | My father served as a Port of Portland Commissioner many years ago in my youth. At the time I did not really know much about what he did in that capacity, but his service to the community made me proud. I'm sure he would be ashamed to find the Port dealing with this issue so inadequately today. | Thank you for your input. |
| 80 | 1 | I am writing this letter to bring to voice my concern regarding the Engineering Evaluation and Cost assessment (EE/CA) for the Port of Portland's proposed early action at Terminal Four and the possibility of building a Confined Disposal Facility at Terminal 4. | EPA has noted your preference. Please see the response to Comment 1-1 . |

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| | | As a concerned citizen of Portland and an environmentally conscious member of the Sierra Club, I was appalled to learn about the lack of insight that led to the Port of Portland deciding on building a "Confined Disposal Facility" (CDF) out of Terminal Four, Slip 1, when other environmentally friendly alternatives were available. The ports decision to build a slip, which would be blocked by a berm made of earth and gravel, and covered with gravel will not solve the problem of cleaning up the Superfund site, rather all it does is leave the dangers for our future generations to face. | |
| 80 | 2 | Building such a structure also has numerous other risks which the port of Portland has failed to recognize. These include but are not limited to: i) Earthquake risk ii) Waste management arising out of an Earthquake iii) Flood risk | Please see response to Comments 2-6 and 2-8 . |
| 80 | 3 | The port should seek alternative technologies that could be used for the project. These include Dredge Emphasis and Landfill Disposal (off-site) and CAP emphasis. | Please see response to Comment 74-9 . |
| 80 | 4 | I have been residing in Portland for the last Four years and I moved to this city due to its environmentally friendly neighborhoods and city policies. Actions like those taken by the Port of Portland will deter future residents who wish to make this great city their home. | Please see response to Comment 2-2 . |
| 81 | 1 | I am writing to express my concern over the proposed method of dealing with the Portland Harbor Superfund Site. I applaud the fact that the government wants the site cleaned up, but feel it is imperative for the safety of ourselves and future generations that the cleanup be done correctly. Our state, and especially the city of Portland, is known for its progressive thinking and environmental consciousness. We have one of the most livable metropolitan areas in the United States. I find it embarrassing as an Oregonian that we had a Superfund cleanup site in the first place, let alone the proposed method of dealing with this hazardous material. | Thank you for your input. Please see response to Comment 1-1 . |
| 81 | 2 | The Confined Disposal Facility (CDF) is just too dangerous to our community. | Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see response to Comments 2-6 and 2-8 . |
| 81 | 3 | It is true that it is a cheap and easy way of dealing with the waste, but the cost to our communities, our children and the health of the Willamette River in the event of containment failure is too high. | Thank you for your input. The importance of protecting people and wildlife from exposure to uncontrolled contamination in Terminal 4 was the reason for undertaking this early action |
| 81 | 4 | My main concern is what might happen in the event of a flood or earthquake, both of which are likely events to occur in our area. As a resident of Oregon City, I saw first hand the ravages of the flood of 1996. I could see a scenario where the integrity of the containment area could be easily compromised. We all know the history of our area and the likelihood of a major earthquake. I am concerned about the failure of the CDF in such an event. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Based on multiple comments like yours, EPA reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment. |
| 81 | 5 | As a member of the Sierra Club, I have been working on issues involving the clean up of the Willamette River. I am gravely concerned that the CDF proposal will not improve the river quality in | Please see the response to Comment 1-1 . |

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| | | the long term and will only result in even more money being spent. I would like to see us be leaders in the cleanup of our Superfund Site and do the job right in the first place. As a mother of two, I believe my children deserve this consideration. | |
| 82 | 1 | We are concerned that the EC/CA proposes more than simply a cleanup of sediment contamination; instead, it attempts to pass the cost of dredging sediments from Slip 3 to depths necessary to accommodate shipping to the potentially responsible parties (PRP's) rather than simply focusing on the dredging of volumes of impacted sediments necessary to address identified ecologic and human health risks. | Depth required for shipping traffic in Slip 3 was not a driving factor in selecting the dredge depth. In general, dredging depth was selected using available literature data, including TECs and PECs, and comparing them to coring data collected at the site. The overall consideration for estimating the dredge volume included evaluation of criteria that are explicitly identified in EPA's NTCRA guidance: (1) evaluation of risk at a level appropriate for a Removal Action, (2) considerations related to implementability and long-term effectiveness and, (3) cost-effectiveness. The ongoing use of Slip 3 was considered, but only in regards to selection of a feasible removal action (i.e. applicability of capping or dredging a particular area). |
| 82 | 2 | Our concerns are focused upon the tailored utilization by the Port of the McDonald Consensus Threshold Effects Concentrations ("TEC") to establish overly conservative cleanup levels which would drive the dredging of sediments to deeper depths and would generate sediment volumes for disposal which far exceed the volumes that would be generated if actual sediment data was utilized to evaluate and eliminate Chemicals of Interest ("COI") that do not present an elevated risk or which represent background conditions in the area. The EE/CA proposes to dredge 105,000 cubic yards of impacted sediments from Slip 3. Our preliminary estimate is that if appropriate risk criterion was employed in evaluating the risk associated with identified COI's present in the Slip 3 area, at most a volume of 38,590 cubic yards of sediments would need to be dredged, which corresponds to 37% of the volume estimated by the Port. The ECA approach effectively attempts to pass the cost of dredging the Terminal 4, Slip 3 to depths sufficient to accommodate vessel berthing to others (PRP's) under the guise of effecting a cleanup action to address demonstrable environmental and human health risk. | See response to Comment 82-1 above. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. Although not the prime objective, the Port of Portland maintains the right to do maintenance work on their slip in a simultaneous cleanup operation. In estimating the proposed dredge volume, TEC and PEC values were considered. TEC is a low effects guideline that represents concentrations below which toxicity effects are unlikely to be observed in freshwater benthic invertebrates. The PEC is a probable effects guideline that represents concentrations above which toxicity effects are likely to be observed in freshwater benthic invertebrates. The use of TEC and PEC values is appropriate for removal actions in Portland Harbor because no site-specific risk-based sediment cleanup levels have been established at this time. Until the baseline risk assessment and CERCLA remedial decisions are made, site-specific risk-based sediment cleanup values will not be determined. To the Port's credit, it wanted to address a contaminated area in the Harbor early and is willing to use nationally-accepted literature values to determine a protective cleanup, rather than wait for site-specific risk values. The data at Terminal 4 clearly established that there were risks to human health and the environment from the uncontrolled contamination at the facility that required action. The Terminal 4 cleanup will be re-evaluated when the Portland Harbor Superfund Site cleanup standards are established to assure that the cleanup is protective. The Port's use of TEC and PEC values to define the cleanup goals of this action may save the Port needless additional costs to remobilize to take additional action that the final cleanup plan may have required if less-conservative values were applied. |
| 82 | 3 | The ECA is not being driven by any demonstrable risk or time considerations identified by the Port. Further, risk drivers for the Portland Harbor Superfund Site have not yet been determined | See response to Comment 82-2 above. |
| 82 | 4 | The approval of the ECA could essentially remove Terminal 4 from the Portland Harbor Superfund Site and the jurisdiction of the ultimate actions required by the eventual Record of Decision for the Site rendered after appropriate consideration of all of the risks presented by the COI's in the area. The implementation of conservative screening levels as de facto cleanup levels under the ECA are proposed simply to achieve the Port's commercial interests. | See response to Comment 82-2 above. |
| 82 | 5 | The EE/CA is not sufficiently rigorous in its consideration of ecologic risk presented by the COI's present in the Terminal 4 area, and other alternatives to the cleanup of the Terminal 4 area should be considered. For the reasons stated above, the ECA clearly does not comply with the requirements of the National Contingency Plan and should not be approved by USEPA. | See response to Comment 82-1 above. |

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| 83 | 1 | I own a home in Linnton and grew up in Portland. The health and future of my community is very important to my family and me. I have a 5-week-old baby who I hope will grow up in this neighborhood and thrive. I do not wish to fear the river water or air we breathe. I want to feel confident that not only my child, but also all the people who live in or visit our neighborhood, can enjoy the Willamette River without worrying about the toxics in it. I know that we have the capacity to make our environment safer than it is, and that some choices require greater resources, commitment, and time to accomplish. | Please see the response to Comment 2-2 and Comment 12-1 . |
| 83 | 2 | For these reasons, I wish to endorse Alternative D of the recommendations offered. I acknowledge that this is the costliest of the alternatives offered, however, in weighing the benefits of having this stretch of the Willamette truly cleaned up over the long term, the costs must be considered an investment in a cleaner future | Thank you for your input. Thank you for expressing your preference. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. Please see response to Comment 1-1 . |
| 83 | 3 | I have significant concerns about the other three alternatives. Specifically, Alternative C, to create a confined disposal facility in slip 1, concerns me as an expedient solution, but not the most permanent solution. | CDFs and other in-water confined disposal facilities have been successfully used in the Northwest. Based on available information, all CDFs in the Pacific Northwest function as intended. |
| 83 | 4 | I understand that this method of CDF has worked for other sites in our region, however, the possibility of significant flooding (such as the 1996 flood) and earthquakes have not been acknowledged to my satisfaction for this part of the Willamette. The recent results of Hurricane Katrina are a powerful reminder of how nature's "anomalies" do indeed happen and end, quite literally, in disaster. If the goal is to clean up this part of the Willamette, the only real solution from my perspective is Alternative D. Alternative C would merely contain the toxics in one area which could be prone to breach from natural (or human) causes. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-6 and 2-8 . |
| 83 | 5 | It is the responsibility of the businesses that created this situation to pitch in and clean up our collective environment. I understand a number of corporations have spent significant resources on studies to clean up the various toxics. Studies however, are not solutions. It is now time for these same parties to join with the government to fund a permanent solution to the mess. The best solution is Alternative D and I ask that the EPA follow through on this recommendation. | Thank you for expressing your preference. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. The Port of Portland is paying for the investigation and cleanup of terminal 4, including EPA oversight costs. Please see the response to Comment 1-1 for a summary of why EPA selected Alternative C. |
| 84 | 1 | The evaluation of liquefaction during seismic events is insufficient for the confined disposal facility (CDF) proposed in Alternative C. As stated in Section 2.3.5.1 of Attachment A, the EE/CA "ignored the potential for liquefaction of the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm." Additional technical analysis by Golder concludes in Section 2.3.5.3 that "liquefaction of the CDF berm, alluvial soils or soil abutments (or some combination thereof) will likely lead to the catastrophic failure of the berm." In Section 2.3.6, Golder recommends construction of the CDF berm in a manner that can minimize the liquefaction potential", and improvement of the existing fill soils at the abutments of the berm and the alluvial soils at the base of the berm to reduce the potential for liquefaction resulting in loss of containment of the CDF. The EE/CA should be reevaluated to consider the engineering feasibility as well as cost analysis for these recommendations. | Please see responses to Golder Comments 2, 3, 5, and 6 . |

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| 84 | 2 | In addition to seismic concerns regarding liquefaction, Section 2.1 of Attachment A notes that "the level of seismic analysis and design required for land-based disposal is significantly higher than has been undertaken for the (EE/CA). If the proposed CDF was regarded as a landfill, then Federal and Oregon state regulations will require that detailed studies of active faults must be undertaken within 3000 feet of the CDF site; and the CDF must not be located closer than 200 feet of an active fault..." As discussed in Sections 2.2.1, 2.2.2 and 2.24, and shown in Figure 2.2 of Attachment A, the Portland Hills and East Bank faults have a high probability of being active and may be located underneath or within 200 feet of Terminal 4. The locations of these two faults and their traces as well as applicability of Federal and State land-based disposal requirements should be determined prior to the selection of Alternative C as an early action. | See responses to <u>Golder Comments 1, 2, and 3.</u> |
| 84 | 3 | Section 3.4.2.3 of Attachment A describes four erosion scenarios for the CDF proposed in Alternative C that could cause loss of containment and/or failure of the berm. Of particular concern, is the potential for erosion from river flows during flood events along the toe of the berm structure at the bottom of the channel (particularly when combined with a seismic event that causes failure of the toe of the berm). Golder notes that the CDF "conceptual design section does not show any armoring or erosion mitigation designs for the toe of the berm along the river side of the structure or at the back-slope side of the berm," and furthermore states that "the cost estimate focuses on propeller erosion instead of river flow erosion, does not provide enough clarification of bank erosion protection as a defined design element, and does not include any provision for toe erosion along the river side of the berm resulting from peak flows and/or seismic failure in the area of the toe of the berm." The potential for erosion of alluvial soils beneath the berm during peak flows should be evaluated prior to the selection of the CDF as a preferred alternative for early action and the EE/CA cost analysis should reflect this evaluation. | <p>Potential short-term impacts of flooding and overtopping the berm during construction will be addressed by specifying construction techniques and by staging of the CDF berm construction. These details will be evaluated during final CDF design. A variety of modeling and historical information was evaluated to assess the potential for flooding impacts on the CDF. As shown below, the CDF can be designed to mitigate potential short-term impacts of flooding and overtopping during construction.</p> <p>The HEC-RAS modeling analyses results presented in Attachment K-1 indicate that the CDF will have no measurable impact on the 100-year flood elevations within the Willamette River. Since the final ground elevation for the proposed CDF design is higher than the FEMA predicted 500-year flood elevation of 31.5 feet NGVD, inundation of the proposed CDF by floodwaters is not anticipated at a higher frequency recurrence interval (e.g., an event less than a 500-year recurrence).</p> <p>Verification of predicted flood elevations is further demonstrated by the February 1996 aerial photograph which was taken at or near the peak flood elevations. This event approximated a 100-year recurrence interval. Provided as Attachment B, the aerial photograph of the Terminal 4 area on February 9, 1996 shows most of the Terminal 4 upland areas dry and not impacted by floodwaters, particularly in the proposed CDF area immediately around Slip 1. The upstream section of the terminal reflects some inundation or ponding adjacent to the bankline, which approximates the 100-year floodplain boundary as shown on the FEMA FIRM Map 4101830060E. However, at the head of Slip 1, the floodwaters do not appear to extend to the top of the banks in the aerial photograph (Attachment B).</p> <p>The <u>February 1996 Postflood Report Hydrometeorological Evaluation</u> prepared by the U.S. Army Corps of Engineers (September 1997) indicates that the peak Willamette River flood elevation at the Morrison gage in Portland was 28.6 feet NGVD. Based on the FEMA Flood Insurance Study, the 100-year flood elevation for the Willamette River at the Morrison Bridge is 28.6 feet NGVD, indicating that the Willamette River experienced a peak matching the predicted 100-year flood event in February 1996 in Portland.</p> <p>The aerial photograph, FEMA flood maps and the recorded flood peak at the Morrison Bridge suggest that the flood peak at Terminal 4 reached around 27.5 feet NGVD, which approximates a 100-year flood elevation on the Willamette River. As the aerial photographs demonstrate that the Slip 1 upland area was not inundated during a low frequency return interval, i.e. 100-years, the potential for the site to flood on a more frequent basis is not expected.</p> <p>Concern regarding the high velocity Willamette River flows was noted. For reference, the average</p> |

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| | | | <p>channel velocity predicted in the FEMA Flood Insurance Study for the City of Portland is estimated at 3.2 to 3.4 feet per second at Terminal 4. While some sections of the channel may experience velocities faster and slower than the average, velocities above the average are typically located in the deeper mid-channel sections and not along the banks.</p> <p>Also, water velocities predicted for other locations of the Willamette River, such as the Morrison Bridge, are not directly comparable to the proposed CDF site because the Willamette River channel widths and depths vary with location with wider and deeper channel sections having relatively lower velocities and vice versa.</p> |
| 84 | 4 | <p>As noted in Section 3.5 of Attachment A, the Willamette River has experienced numerous large recent flood events that can "produce water elevations and velocities that have the potential for inundating the proposed T4 area, causing erosion damage to the river banks, and mobilizing channel bottom sediments." In contrast to the low-velocity Columbia River backwater flooding characterized by the Port of Portland at the PHCAG meeting, large high-velocity flood events along the Willamette River occurred in December 1964 and February 1996 as the result of intense rainfall and snowmelt west of the Cascade Divide despite flood control operations to the maximum extent possible by the United States Army Corps of Engineers (US Army Corps) in the Willamette River Basin. These two floods are characterized in Section 3.3.2 of Attachment A; The Pacific Northwest Floods of February 6-11, 1996, Proceedings of the Pacific Northwest Water Issues Conference, Portland, Oregon, October 7-8, 1997, American Institute of Hydrology, 1997; and February 1996 Post flood Report Hydrometeorological Evaluation, US Army Corps of Engineers, September 1997. These reports indicate that inundation of the proposed CDF location may occur at a high frequency recurrence interval for the preferred Alternative C in the EE/CA. Visual representation of the 1996 Willamette River flood is provided in the US Army Corps aerial photograph of the Terminal 4 area on February 9, 1996 (Attachment B), one day after the peak flow. Additional photos of this flood are available in the February 1996 Postflood Report Hydrometeorological Evaluation, US Army Corps of Engineers, September 1997. Videos are also available at the Oregon Historical Society for the 1964 flood event (Call Numbers 01804 and 01909) and the Multnomah County Library 1996 flood event (Wild Winter, Call Number Video551.489WILD). A February 11, 1996, newspaper article in the Oregonian (Attachment C) notes that "Flooding knocked the Port of Portland, one of nation's busiest ports, out of business. Water covered portions of all five terminals at the port." The combination of these flood reports, photos, and video footage underscore risk concerns regarding failure of the CDF during high velocity Willamette River flows that have not been acknowledged in the EE/CA or by the Port of Portland. In addition to preventing erosion at the toe of the CDF berm, the preferred Alternative C in the EE/CA should include provisions to prevent CDF failure or loss of containment due to potential Willamette River flooding during the short-term construction of the CDF and long-term life of the project.</p> | <p>The final ground elevation for the proposed CDF design is higher than the FEMA predicted 500-year flood elevation of 31.5 feet NGVD. Consequently, inundation of the proposed CDF by floodwaters is not anticipated at a high frequency recurrence interval.</p> <p>See Response to <u>Comment 84-3</u>.</p> <p>As explained above in response to <u>Comment 75-4</u>, the comparative analysis technique presented in Section 8 of the Terminal 4 EE/CA provides the least subjective comparative analysis tool. In this evaluation technique, two and always only two alternatives are compared to each other, and therefore it is evident using professional judgment and experience, which one rates higher to the other from the aspect of comparison. Rigorously applying this technique for all pairings of alternatives for every aspect of the evaluation criteria provides the least subjective method of comparing removal action alternatives.</p> <p>Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills.</p> <p>Risks considered in the EE/CA are appropriately limited to the dredging methods, transport and disposal for the Terminal 4 sediments. Risks associated with transport of dredge sediments from other areas within the Portland Harbor Superfund Site to the CDF or to upland landfills depends on the specific circumstances of that action, and will be considered by EPA specific to that area's removal or remedial action decision.</p> |
| 84 | 5 | In comparing the removal action alternatives against EPA criteria, the | As explained in response to Comments 75-4, the comparative analysis technique presented in Section |

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| | | <p>EE/CA ranks the preferred Alternative C with the highest overall average score of 0.1333 while Alternative D is considered to exhibit the least overall relative performance at meeting the requirements of the evaluation criteria with an overall average score of -0.3. This subjective, qualitative comparison suggests that dredging with landfill disposal (Alternative D) is less effective than monitored natural recovery (Alternative A), capping in place (Alternative B), or dredging to a confined disposal facility (Alternative C). However, based on the criteria of overall protection of public health and the environment, Alternative D presents the lowest short-term and long-term risk to public health and the environment. For instance, referring to short-term effectiveness, Section 8 of the EE/CA states that Alternative A "represents relatively little risk to the community, site workers, and the environment," while Alternative B "represents moderate risk," Alternative C "represents very low risk," and Alternative D "represents low to moderate risk." Similarly, Alternative C is preferred in the EE/CA for short-term and long-term effectiveness based on minimal resuspension of contaminants from a hydraulic dredge, and a low probability of exposure during handling and transport of contaminated sediments. However, Section 8 of the EE/CA does not adequately consider the economic and engineering feasibility of hydraulic dredging for Alternatives A, B and D. In addition, Section 8 does not consider the potential for barge accidents during transport to the CDF over the lifetime of the Portland Harbor Superfund project for Alternative C, and does not consider the severity of consequences in comparing the risks of the four alternatives. During the PHCAG Meeting, the Port of Portland suggested that risk scenarios involving variable severity and probability could not be compared in the EE/CA because their differences are like comparing "apples to oranges." However, similar variable risk scenarios have been evaluated for risk decision-making at hundreds of facilities throughout the United States as required by EPA's Risk Management Plan Rule (40 CFR 68). A typical reference text for comparative risk ranking under 40 CFR 68 is the Guidelines for Hazard Evaluation Procedures, 2nd Edition with Worked Examples, Center for Chemical Process Safety, American Institute of Chemical Engineers (AIChE). Tables 7.7, 7.8 and 7.9 of this text demonstrate an effective engineering method for ranking risk scenarios based on both probability and severity of accidental releases (Attachment D). Based on the description of probabilities in Section 8 of the EE/CA combined with the severity of consequences described in flood and seismic events in the above OCEH comments, an engineering evaluation of risk using the AIChE procedures would likely result in Alternative C being "Unacceptable" while Alternative D would likely rank as "Acceptable with Controls." To meet the remedial action objective of overall protection of public health and the environment, the comparative analysis presented in the EE/CA should be reevaluated to include a more objective, engineering-based evaluation of risk that includes severity of consequences as well as probability.</p> | <p>8 of the Terminal 4 EE/CA provides the least subjective comparative analysis tool. In this evaluation technique, two and always only two alternatives are compared to each other, and therefore it is evident using professional judgment and experience, which one rates higher to the other from the aspect of comparison. Rigorously applying this technique for all pairings of alternatives for every aspect of the evaluation criteria provides the least subjective method of comparing removal action alternatives.</p> <p>Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills.</p> <p>Risks considered in the EE/CA are appropriately limited to the dredging methods, transport and disposal for the Terminal 4 sediments. Risks associated with transport of dredge sediments from other areas within the Portland Harbor Superfund Site to the CDF or to upland landfills depends on the specific circumstances of that action, and will be considered by EPA specific to that area's removal or remedial action decision.</p> <p>The intent of the Removal Action at Terminal 4 is narrowly focused on reducing environmental exposure and risk originating from exposure to the bedded sediments within the Removal Action Area. The capping and CDF technologies included in Alternative C block exposure to contaminated sediments in the relevant areas, which comprise more than 70 percent of the Removal Action Area and include some of the most contaminated sediments. Blocking the exposure clearly reduces the risk associated with sediments in these areas. The EE/CA, see Appendix M, also demonstrates that dredging to the specified depths in Slip 3 will significantly reduce the concentrations of contaminants in surface sediments, thereby reducing exposure of aquatic organisms and reducing risk. The substantial reduction in concentrations also clearly reduces the exposure of other aquatic receptors and ultimately humans from contaminants currently contained in surface sediments.</p> <p>EPA agrees that its decision on the Terminal 4 Removal Action alternative may have an impact on the remedial options for the overall Superfund Site. The Removal Action at Terminal 4 is only one element of the overall remedial action that will occur throughout the Superfund Site. The NTCRA Guidance (EPA 1993) requires EPA to look at the removal action in the context of the overall Superfund Site. Thus EPA considered disposal options, including the CDF, in the context of the overall Superfund Site as part of the EE/CA Appendix Q, 404(b)(1) Analysis Memorandum.</p> <p>Section 8 of the EE/CA discusses that Alternative C (CDF) lends itself to the use of hydraulic dredging. The EE/CA does not state that hydraulic dredging would not be useable for other alternatives (See Section 5.3.1).</p> |
| 84 | 6 | The preferred early action Alternative C selected in the EE/CA does | Thank you for your input. The CDF proposed in the Terminal 4 EE/CA creates excess capacity for disposal |

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| | | not meet the removal action objectives to reduce ecological and human health risks associated with sediment contamination, nor to reduce the likelihood of recontamination of sediments within the removal action area. Although the EE/CA proposes Alternative C as an 'early' action, this alternative assumes a long term remedial option for the overall Portland Harbor Superfund site, and the consequences of this selection will significantly impact future decision-making for all parties involved in the Portland Harbor Superfund process. For this reason, OCEH requests exceptional scrutiny by EPA of Alternative C as the preferred alternative for the Terminal 4 early action. | <p>of sediments from the Willamette River, but it provides no guarantees for placement of future Portland Harbor sediments, or other disposal siting decisions that require analysis in the Portland Harbor Superfund Site RI/FS. In addition, this early action provides no assurance to the Port regarding further work at the site that may be identified in the harbor-wide cleanup proposal.</p> <p>The Terminal 4 removal action will provide a reduction in risks from contaminated sediment at Terminal 4 and provide an on-site disposal option to consider, if appropriate, for the larger Portland Harbor cleanup. The removal action will remove contaminated sediment, which is uncontrolled within the river, and isolate the contaminants within an engineered facility, thus eliminating potential exposure to aquatic life and humans. Disposal of non-hazardous waste in a CDF is as safe as upland disposal. Criteria will be established for determining the suitability of materials that will be placed in the CDF.</p> <p>An in-water disposal site will reduce the overall impact and potential environmental and public safety implications associated with transport of materials to offsite disposal facilities. Having one or more disposal options for the Portland Harbor Superfund Site also helps control the cost of disposal because it creates a more competitive market for disposal and may also make removal of contaminated sediment a more cost-effective cleanup option. Consolidation of contaminated sediments into a limited number of locations may reduce the area within the Willamette River where contaminated sediments would be contained in place.</p> |
| 84 | 7 | In summary, OCEH recommends the selection of Alternative D to meet these objectives, or reevaluation of the EE/CA to address the concerns outlined above and in Attachment A. Furthermore, OCEH recommends additional economic and engineering feasibility analysis of hydraulic dredging combined with dewatering of sediments as a technical solution for alternative D to reduce the risk of recontamination during removal of selected contaminated sediments. | Thank you for your input. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. See Responses to Comments above. |
| 84 | 8 | Thank you for creating a process for receiving public comments on the EE/CA. Please consider the OCEH comments as EPA continues to coordinate the cleanup and restoration of the Portland Harbor | EPA appreciates your involvement in this analysis. |
| 85 | 1 | ORRA appreciates the time, effort, and money that the Port of Portland (the Port) has invested in developing the four cleanup alternatives. The result of that effort is a determination that a Confined Disposal Facility (CDF) is the preferred cleanup alternative, and that choice is the focus of these comments. | Thank you for your input. |
| 85 | 2 | Upland Disposal Provides Significantly Better Long-Term and Overall Environmental Protection. ORRA is not convinced that a CDF is the best environmental solution for the contaminated river sediments problem. Upland disposal sites have significantly better long-term environmental protections that the CDF cannot provide. Upland disposal sites have geological and climate advantages, as well as multiple protections of groundwater. They are lined, permitted facilities that meet and exceed the requirements of federal and state laws. A CDF does not meet the same criteria. | See response to <u>Comment 75-11</u> and response to <u>Golder Comment 1</u> . |
| 85 | 3 | ORRA does not agree that CDF disposal satisfies Applicable or Relevant and Appropriate Requirements (ARARs) for solid waste disposal. Under Oregon regulations, contaminated sediments from a Superfund cleanup are considered "cleanup materials contaminated with hazardous substances." OAR 340-093-0030(14); OAR 340-093-0170. If disposal is determined to be the appropriate management strategy, then Oregon regulations and CERCLA require disposal at a | See response to <u>Comment 75-15</u> . |

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| | | landfill that meets the substantive design requirements of 40 CFR Part 258, Subpart D or an approved alternate design that satisfies specific performance criteria. OAR 340-093-0170(3)(a). While the Engineering Evaluation/Cost Analysis (EE/CA) Report asserts that CDF disposal will comply with ARARs, it does not explain how, especially given that the CDF is an unlined facility that does not meet the Part 258 standards or the alternate performance criteria. | |
| 85 | 4 | With CDF Disposal, Long Term Environmental Risks Will Remain. The EE/CA Report asserts that leaching of contaminants from the silt particles will not occur as long as the silt remains wet, thus the CDF is the best environmental solution. However, a CDF does not remove the risk from the river environment. An arid landfill site has long been accepted as the best repository of such contaminants, and is the only alternative that actually removes the contaminated sediment from the river. | See response to Comment 75-11 and response to Golder Comment 1 . |
| 85 | 5 | Upland disposal is the only reasonable option that embraces the regionally accepted goals of environmental protection at a reasonable cost. | See response to Comment 1-1 . |
| 85 | 6 | The EE/CA Overstates the Incremental Benefits of the Effect of Hydraulic Dredging. The EE/CA also contends that the CDF alternative provides better sediment containment because hydraulic dredging is possible, a technology that doesn't disturb the water column to the degree of other dredging methods. Since only 30% of the material going into the CDF can be placed using hydraulic dredging, the water column sedimentation benefit should not be highlighted as a major benefit in this case. | Hydraulic dredging is an attractive method for filling the CDF because a relatively high dredging production rate can be maintained in Slip 3. With respect to the sediment containment benefits of hydraulic dredging, the sediment analyzed in the EE/CA is limited to the Terminal 4, representing 100% of the sediments evaluated. |
| 85 | 7 | The Excess Capacity from the CDF Disposal Alternative Circumvents Important Regulatory and Permitting Requirements and Sets a Poor and Unfair Precedent for Solid Waste Disposal | Any additional sediment proposed to be placed in the CDF will need to meet established criteria (criteria will be subject to a public input process). The CDF proposed in the Terminal 4 EE/CA creates excess capacity for disposal of sediments from the Willamette River, but it provides no guarantees for placement of future Portland Harbor sediments, or other disposal siting decisions that require analysis in the Portland Harbor Superfund Site RI/FS. In addition, if no additional contaminated sediment is placed in the CDF, the Port will need to apply for applicable federal and state approvals to fill with clean fill or other dredged material from navigation dredging. If no other fill is allowed, EPA may need to consider whether the Terminal 4 cleanup requires modification to assure protection of human health and the environment in the long-term. |
| 85 | 8 | The relative cost differences between the four alternatives are not large. In fact, the CDF alternative is the most expensive of the alternatives, unless the Port is actually able to recover its projected \$10 million in savings by charging others to dispose of their contaminated sediments in the CDF as well. This leads to a number of additional concerns | See response to Comment 75-16 . |
| 85 | 9 | If the CDF option benefits from disposal of off-site materials in the amount of 570,000 tons, the Port should describe how the material will be removed from its point of origin, transported and off-loaded into the CDF. Anything short of a reasonable understanding of the project methods casts doubt on the actual cost savings. | In order to move a project forward, some of these details are worked out in the design phase of the project. Public input is important to this phase of the process as well. |
| 85 | 10 | What are the limits on the types of sediments that can be accepted at the CDF? CDF sites are allowed to by-pass most of the state's permitting processes through special exemptions. If the CDF will be used for materials not actually within the scope of work of the | As described in Section 9.3 of the EE/CA, as part of the Slip 1 CDF design, EPA will establish suitability criteria for all sediment proposed for disposal in the CDF. Contaminated sediment that fails the typical tests used to characterize waste as hazardous will not be allowed in the CDF. In addition, EPA will require a public input process for establishing the suitability criteria. Creating disposal options for the Portland Harbor |

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| | | immediate cleanup, then the Port will be competing with the private sector without the same level playing field. | Superfund site at Terminal 4 may help control the cost of disposal because it creates a more competitive market for disposal. |
| 85 | 11 | Before accepting any third party waste, the Port should be required to go through a public permitting process and meet all state criteria for a RCRA Subtitle D landfill, like every other facility in the state of Oregon must do prior to accepting this material. This includes liners, surface and ground water monitoring, waste acceptance procedures and plans, financial assurance plans for closure and post closure, and other pertinent criteria of subtitle D and the Oregon Rules. | See response to Comment 75-15 , 75-16 , and Golder Comment 1 . |
| 85 | 12 | The economic analysis, which concludes that \$10 million can be saved by charging third parties for future use, is unsubstantiated and appears to potentially put the Port and tax payers at risk of funding what would be the most expensive option, if other sources of sediment do not materialize or responsible parties elect not to use the CDF because of long-term environmental liability or economic concerns. There is no guarantee that other parties will elect to use this facility if it is built. | Construction of the CDF at Terminal 4 will create an on-site disposal option for consideration in making harbor-wide cleanup decisions. See response to Comment 1-1 . Although cost was considered as part of the EE/CA analysis, it was not the driving factor for selection. |
| 85 | 13 | The CDF alternative sets a worrisome precedent for the region. Other areas of the Willamette and Columbia Rivers could become potential repositories of contaminated materials, for the sake of minor financial benefits while risking serious long-term environmental damage. | CDFs have been used with great success in the Northwest. In Commencement Bay alone, several million cubic yards of contaminated sediment have been safely and permanently contained. |
| 85 | 14 | In conclusion, ORRA believes that a fair review of the four alternatives would lead to the conclusion that upland disposal is the best environmental solution for the contaminated sediments cleanup. | The evaluation of alternatives in the EE/CA found that all alternatives, including both upland and CDF disposal of contaminated sediments are protective of human health and the environment. Alternative C was identified as the strongest option for eliminating risk pathways. |
| 85 | 15 | (Footnote ¹ : Of the remaining alternatives, ORRA's opinion is that both the "cap-in-place" and the "monitor-in-place" alternatives should be rejected because neither provides a better environmental solution than upland disposal and the relative cost savings are minor as well. As discussed in these comments, ORRA believes that upland disposal is the best available alternative.) | Capping and monitored natural recovery can not be used everywhere, but they can be valuable tools for reducing risks posed by contaminated sediment and are part of the preferred alternative. |
| 86 | 1 | On behalf of various City of Portland bureaus we appreciate this opportunity to comment on the Port of Portland proposed cleanup of contaminants at Terminal 4 in the Lower Willamette River. This early cleanup effort is one of three being undertaken in advance of the larger scale investigation and feasibility study of actions needed to address a broader range of contaminants in the Portland Harbor Superfund site. The City is participating and providing major funding support for that larger investigation in order to speed the assessment and cleanup of the entire Harbor area. This longer-term effort is being funded by the Lower Willamette Group, which includes the City, the Port and a number of private parties proceeding under the supervision of the U. S. Environmental Protection Agency (EPA) | Thank you for your input. |
| 86 | 2 | We are pleased that the Port, Northwest Natural Gas and, more recently, Arkema have agreed to undertake early cleanup actions at some of the most contaminated sites in the Harbor. We are also gratified that EPA, the Oregon Department of Environmental Quality (DEQ) and six partner Tribal governments have devoted the resources and time to provide impetus and guidance for these | EPA agrees that actions are required to protect human health and the environment and early actions should be completed wherever possible. |

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| | | actions. Early cleanup activities such as these need not wait for the overall Superfund site assessment and, if conducted in a timely and effective manner, they can significantly reduce the risks to human health and the environment long before the site as a whole can be addressed. | |
| 86 | 3 | The City has monitored the Port's proposed Terminal 4 early action from the outset. We have reviewed the recently released Public Review Draft, Engineering Evaluation/Cost Analysis (EE/CA) Report. The City acknowledges the significant amount of work that has gone into the preparation of this report and commends the Port and governmental entities for advancing the effort to this stage. The work completed to date by the Port has been undertaken in an open process through which a variety of potential technologies—including dredging, capping and treatment—were identified, reviewed and assembled into remedial alternatives. These alternatives were then screened against specific criteria established by EPA for Superfund site cleanups. The preferred alternative identified through this process emphasizes dredging to physically remove the highly contaminated sediments, primarily located in Slip 3 at Terminal 4, and dispose of them onsite in a confined disposal facility to be constructed in Slip 1. | Thank you for your input. |
| 86 | 4 | The City is supportive of this early action concept and this effort to improve river health. However, it must be acknowledged that any removal of contaminants and disposal at this site near the mainstem channel of the Willamette entails risks and uncertainties. These will need to be addressed in more detail as the early action design work proceeds. | We agree that the design work is very important in making sure that the select action yields the anticipated benefits. |
| 86 | 5 | we are concerned about the potential impacts of the project on sediment quality outside the early action area during construction, | A detailed Removal Action work plan will describe the construction activities and schedule, as well as procedures to protect the public, site workers and the environment during all field activities. Mitigating measures such as silt curtains or other in-water controls will be described and reviewed by EPA. In addition, a Removal Action Area-specific Health and Safety Plan (HASP) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms (e.g., dust control) and adhering to legally applicable or relevant and appropriate requirements. |
| 86 | 6 | we are concerned about the potential long-term effects to surface water quality during and after construction | <p>The Removal Action Work Plan will describe the criteria for surface water quality (to be included in the Water Quality Certification process) and measures to be implemented to achieve the criteria. Specifics of design and construction of containment technologies and best management practices will be included in the Work Plan. The Water Quality Certification will require certain actions and criteria to be met, and contingencies for implementation.</p> <p>Long-term effects to surface water quality will be addressed by the EPA-required CDF monitoring program. In evaluating the long-term effectiveness of the Removal Action, EPA have identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the monitored natural recovery (MNR) and to verify the long-term adequacy of the performance of the sediments caps. In addition, post removal action confirmation sampling and analysis will be conducted after construction to provide direct measurement of residual concentrations. Corrective actions will be taken if caps or dredged areas fail to meet performance requirements. All of these are being required by EPA to ensure that releases from the CDF do not occur.</p> |
| 86 | 7 | we are concerned about the long-term stability of the confined | The proposed Removal Action has undergone a evaluation by EPA to make sure that rigorous examination |

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| | | disposal facility | of flooding, earthquakes and other catastrophic event was part of the evaluation of Alternatives. Please see the responses to Comments 2-6 and 2-8 |
| 86 | 8 | we are concerned about how this work will be integrated with the overall Portland Harbor Superfund clean up approach | Please see response to Comment 1-1 . |
| 86 | 9 | how proposed mitigation activities will fit with the City's River Renaissance and watershed management initiatives. | Because Terminal 4 is limited in size and there is no public access, it is unlikely that this early action will have a significant effect on River Renaissance or watershed management initiatives. Please see the response to Comment 6-2 and Comment 28-35 for additional detail on mitigation. |
| 86 | 10 | We emphasize the need for careful design, implementation and monitoring to minimize the risk of spreading contaminants during construction. We also understand, as members of the concerned public are making clear, that disposal of contaminated sediments within the Superfund site and adjacent to the river channel is controversial, that it must be undertaken with rigorous safeguards in place and that it must include a sound monitoring program to ensure that the materials will be safely contained for a long period of time. A detailed long-term monitoring plan with a clear action plan will help ensure that any difficulties that may arise can be addressed in an expeditious manner. | Based on multiple comments like yours, EPA reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment. Please see the response to Comment 86-6 for additional information about long-term effectiveness and post-removal site controls, and monitoring. |
| 86 | 11 | A sound mitigation program will also be needed to help ensure compatibility with the City's interest in Lower Willamette River restoration. | See response to Comment 86-9 . |
| 86 | 12 | The City intends to follow closely the detailed design of the final remedy and the development of the monitoring program and related action plans. | Thank you for your input. |
| 86 | 13 | In order to gain public confidence in the project, it will be important that the early action design and implementation, including appropriate mitigation activities, are reviewed and undertaken in an open public process with the public interest in mind and it will be important to demonstrate that the project clearly contributes to the collective goal of improving Willamette River health for the long term. | EPA will provide additional public involvement opportunities relating to this project. Selection of appropriate sediment disposal criteria will be open to public comment. In addition, proposals from additional PRPs within Portland Harbor to dispose of sediment in the CDF will be subject to the public input process. |
| 86 | 14 | In the course of further deliberations on the project, we recognize the confined disposal facility is currently the preferred alternative and that it may have other benefits in the context of the overall cleanup. Nonetheless, we want to be certain that other alternatives developed to date are not lost in the event the confined disposal facility becomes, on further examination, inappropriate or otherwise infeasible. | Please see the response to Comment 42-2 . |
| 87 | 1 | ODFW's main objectives are to: <ul style="list-style-type: none"> • Provide for an uncontaminated habitat for the area's fish and wildlife species to thrive and reproduce in; • Maintain or enhance the current amount of useable habitat for all species found in the area; • Provide for and maintain a continuing recreational fishery for all game and sport fish present in the area; and • Assure that fish harvested in the area are safe to consume. | Thank you for your input. EPA's objectives are consistent with ODFW's. |
| 87 | 2 | Under the "Removal Action Objectives" (Chapter 4), one of the objectives should be to minimize the impacts to fish and wildlife | The "Removal Action Objectives" were established and approved by EPA in the Work Plan (Section 6.2.1), as required by the Administrative Order on Consent and attached Scope of Work. |

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| | | impacts to fish species that may be present. | |
| 87 | 9 | Sediment capping: Determine the types of habitats that are being covered and consider engineering the cap to provide for similar or enhanced habitat to what is being covered or providing for the habitat elsewhere. Monitor for contaminant leakage and effects on biota (invertebrates) over an extended period. Develop a plan to evaluate the stability and durability of the cap over time and after major high intensity storm and flood events. | The habitat-related issues will be addressed with the mitigation planning process referred to in response to <u>Comment 87-2</u> . Long-term monitoring of the caps and CDF for structural integrity and performance will be included in the site monitoring plans. |
| 87 | 10 | Confined Disposal Facility (CDF): The slip is used by a variety of sport and game fish. In consultation with ODFW devise a method for salvaging sport and game fish out of the slip and then excluding them from returning as the slip is converted to a containment facility. | The conservation measures referred to in response to <u>Comment 87-2</u> addresses the salvage and protection of fish species during implementation of the Removal Action. Please also see Appendix Q of the EE/CA for more details. The mitigation planning process referred to in Comment 87-2 will consider lost habitats and mitigation requirements. |
| 87 | 11 | Determine the types of habitats being lost through conversion of the slip and propose a method for providing similar or enhanced habitat elsewhere. | Please see response to <u>Comment 6-2</u> . |
| 87 | 12 | Again ODFW thanks you for the chance to comment on the alternatives for cleaning up the T4 site and is encouraged that the Port of Portland is moving ahead with plans to address contamination in Portland Harbor. | Thank you for your input. |
| 88 | 1 | I don't think the CDF is a good idea. There are too many questions about the long-term impacts of this project. Along with the Portland Harbor Community Advisory Group (CAG) evaluation committee, I looked over the EE/CA, the Golder memorandum, listened at CAG meetings, and read other groups' letters. The CDF planned is inadequate to contain the sediment from the Portland Harbor cleanup. It will leak and the berm will liquefy; in a disaster, all the contaminated sediment will be back in the Willamette River. | EPA has noted your preference. Please see response to <u>Comments 2-3, 2-6, 2-8, and 5-2</u> . |
| 88 | 2 | The public health impacts of this sediment recontaminating the Harbor are enormous. The impacts to fish and other wildlife would be huge. You've gone to a lot of trouble to find out how bad the pollution is in the Harbor. The fish resident in the Portland Harbor suffer measurably. Don't let the toxins back in the river after removing them. | All of the alternatives analyzed in the EE/CA will result in long term benefit to the community from reducing the risk of exposure to contaminated sediment. Under the proposed alternative, uncontrolled pollution that currently poses a risk to human health and the environment will be removed and placed into a well designed disposal facility. Sediment placed in the CDF is not hazardous waste under the law. See response to <u>Golder Comment 1</u> . |
| 88 | 3 | we have concerns about the viability of the proposed facility in both earthquake and flood conditions and many questions about the long-term ecological and human health impacts. | The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. |
| 88 | 4 | This CDF, as the Port has pointed out, is a landfill operation and, as such, must meet Federal and State regulations for landfills. These include detailed studies of active faults within 3000 feet of the CDF site; locating no closer than 200 feet of an active fault (defined as movement within the last 10,000 years) for solid waste, and 1,320 feet if the waste is classified as hazardous; the CDF must be designed for a maximum horizontal acceleration with a 2,475-year return period. The report from Golder Associates suggests that adequate analysis of the risks from earthquake has not been done and that compliance with applicable Federal and State laws for landfills in earthquake zones will ultimately not be achievable. | Please see the response to <u>Golder Comment 1</u> . |
| 88 | 5 | The Port's consultant, BBL, ignored the potential for liquefaction of | See response to <u>Golder Comment 5</u> . |

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| | | species habitat affected by the action for both the short and long term. This is an additional standard beyond ecological health risks. It basically speaks to considering the habitat values provided in those areas where cleanup actions will take place and either designing the cleanup action to provided similar or enhanced habitat values after the cleanup is complete in those areas or providing similar replacement habitat values within the Portland Harbor area. | However, the Removal Action must comply with ARARs to the extent practicable, including the Clean Water Act (CWA) Section 404(b)(1) and the Endangered Species Act (ESA), both of which provide for minimizing impact to aquatic species during construction of the project. In addition, Section 404 of the CWA provides for mitigation of aquatic habitat impacted by the project. The potential requirements of the CWA 404(b)(1) and the ESA are evaluated in EE/CA Appendices Q and P, respectively. Under Alternative C, provisions of the CWA 404(b)(1) will require compensatory mitigation for lost aquatic habitat in Slip 1. Appendix Q describes the types of considerations that will be addressed in the CWA 404(b)(1) analysis, and outlines a process and schedule for development, review, and approval of a mitigation plan prior to construction. To address requirements of the ESA, a Biological Assessment was prepared (EE/CA Appendix P) and will be finalized based on the final design considerations, subject to review by NOAA and USFWS. EPA anticipates that ODFW will be a key reviewer of the CWA 404(b)(1) analysis, the mitigation plan, and the BA. |
| 87 | 3 | For all alternatives ODFW believes that monitoring for impacts on fish and wildlife is an important component of any cleanup and should be factored in as a long term endeavor (especially if some contamination is to remain on site). Monitoring should go beyond chemical analysis of sediment and water to bioaccumulation and other effects within the biota (especially invertebrates and bottom feeding long lived species such as sturgeon). | EPA looks forward to working with ODFW and other resource agencies to incorporate these types of concerns as we develop and implement monitoring programs during the design phase of the Terminal 4 project. One of the challenges we face is determining how to appropriately assess the effectiveness of the site specific removal action independent of contaminants and other special and temporal influences of the larger Portland Harbor site. |
| 87 | 4 | The five year time frame for monitoring effects to the ecology of the harbor is too short to ascertain whether there are any long term continuing effects. There should be a continuing evaluation of the biota over a much longer time period. Monitoring may be scaled back over time to periodic sampling and reviews (say every five years) and could be combined with a Portland Harbor wide periodic review of ecological health in the harbor | See response to Comment 87-3 . EPA agrees that monitoring may be needed beyond the initial 5-year monitoring period in order to ensure the continued protectiveness of the removal. |
| 87 | 5 | The monitoring strategy should also take into account long term stability (longer than 5 years) of those measures which leave contaminated sediments in place (Capping, CDF, and MNR). At a minimum monitor for contaminant leaching and erosion. | See response to Comment 87-3 . |
| 87 | 6 | Additionally, there should be a plan for evaluating control structures after major events such as earth quakes, high intensity storm and flood events | EPA will make sure that specific language is included in a monitoring plan to ensure the CDF is examined immediately following a catastrophic event |
| 87 | 7 | Monitored Natural Recovery (MNR) sites should include monitoring of contaminate effects on the biota such as invertebrates. Biota should be analyzed for bioaccumulation, species component changes and physiological effects. | Thank you for your input. See response to Comment 87-3 . EPA will consider the proposed assessment during review and approval of the final monitoring program. |
| 87 | 8 | Sediment dredging: to minimize the impact to fish species work should be accomplished within the "In water work period". ODFW would prefer that any dredging be conducted during the "summer" in-water work period for the Willamette River (July 1 – Oct 31). There is more risk for contaminated sediment escaping work sites during the winter high flow periods and far more juvenile salmonids are present during the winter work period. Dredge sites should also be isolated to contain sediment laden/turbid water from escaping the work site (turbidity/sediment curtain). Fish should be salvaged from isolated work areas. If some actions require working in water outside this period ODFW's requests that the district biologist and office be consulted in order to provide recommendations for reducing potential | See response to Comment 87-2 . |

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| | | the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm. The Golder analysis predicts that approximately 30 feet of alluvial soil is anticipated to liquefy at the toe of the CDF berm and that approximately 20 feet of alluvial soil is also anticipated to liquefy beneath the berm during a CLE earthquake. Risks of this nature are unacceptable to the public and relying on an engineering fix after federal approval skirts applicable laws and would require further public comment. | |
| 88 | 6 | The conceptual design for the berm does not address potential erosion or scour along the river side toe of the berm during peak flood events. Regulatory requirements for disposal of contaminated materials in floodplains state that a proposed facility cannot "expand or modify a landfill in a floodplain in a manner that will allow the facility to result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources." The proposed CDF design does not adequately address this criterion with respect to provisions for bank erosion from the dynamic movement of the river or scour. It also does not address erosion along the toe of the berm during peak flows or in the event of an earthquake. | Berm construction details described in Appendix K of the EE/CA were reviewed based on your concerns and were found to be addressed adequately. Some of the measures include placing clean sandy gravel fill within training berms. Training berms are usually built using quarry spall, rip-rap in order to be erosion resistant. During the design the erosion potential will be evaluated and the rip-rap size selected accordingly. |
| 88 | 7 | A section on recontamination/re-suspension is missing from the report. The impacts of deposition and erosion along the river and the impact on dredging, capping, the CDF berm, and natural attenuation should be given significantly more discussion and consideration. | See response to Comment 28-26 . |
| 88 | 8 | In summary, this proposal for a confined disposal facility in the Willamette River is not rigorous enough in design to provide adequate assurances to the public that it will withstand both earthquake and potential flood events. | Please see responses to the Golder report . |
| 88 | 9 | Furthermore, additional questions remain in regard to this site's projected lifetime and the level of monitoring and maintenance that would be required. | Alternative C, as proposed, is a long-term and permanent strategy to isolate and control contaminated sediments. Long-term monitoring will be an essential part of evaluating the effectiveness of the Removal Action and the ongoing integrity of the CDF. The final monitoring plan has not been developed yet, but it will require extensive monitoring for the first 5 years, and every 5 years. Maintenance of the CDF was considered during the preliminary design and EE/CA evaluation. The feasibility-level cost estimate for CDF maintenance was \$500,000, applied to a 30-year timeframe. |
| 89 | 1 | The St. Johns Neighborhood Association is concerned with the concept of the Confined Disposal Facility at the Port of Portland's Terminal 4 and the storage of contaminated sediments in North Portland. | Alternative C represents very low short- and long-term risk and is anticipated to have a neutral or positive influence in the community. |
| 89 | 2 | We support the process of targeting clean up areas for Early Actions, but feel the T4 site might not be a good candidate for an Early Action, especially if it is to move the contaminants from in water to in ground with no option to later go back and clean these contaminants up at a future date. | The use of a CDF is not intended to be a temporary cleanup measure. The materials placed in the CDF will be non-hazardous materials, and when full, the slip will be converted into water dependent use by the Port. Please see response to Comments 2-3 , 5-2 , and 1-1 . |
| 89 | 3 | We understand that capping and/or a CDF will lower the health risks in water but find that the risks would be left on land (the generation of a Brownfield) with would not be acceptable to our community here in North Portland. | Capping and confined disposal facilities are proven methods for protecting communities and ecological receptors from exposure to contamination. However, they do require long-term monitoring and maintenance. |
| 89 | 4 | A community that is already being asked to accept the health risks of a leaking landfill (St. Johns Landfill), a Wastewater Treatment Plant, a clean up site that was capped (McCormick & Baxter Site), and the | EPA shares your concern that your north Portland neighborhood has inherited a legacy of contamination from a century of historical industrial practices. Multiple exposures to contaminants can be a legitimate concern, and it is one of the reasons that capping or confining material in a CDF are important actions to |

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| | | constant air pollution from freight traffic (diesel trucks and rail engines). We understand that these are considered different types of risks and are not looked at as comparables when evaluating cleanup options, but we feel they should be looked at. Are these different types of contaminants additive when it comes to a community's health? Should a cleanup option/method take into consideration preexisting conditions within a community regarding health? | protect human health. Additive and cumulative effects are not a concern specific to the Terminal 4 removal. The harbor-wide cleanup will likely propose a variety of cleanup actions needed to address concerns posed by cumulative or additive contamination problems. |
| 89 | 5 | In capping options as with the CDF option we would be asking to place these contaminants into a perpetual storage without the option to cleanup and treat the contaminants at a future date with new technologies as they develop. We must not be in such a hurry to rush in to cleanup a site with a method that will not leave future generations a way to take care of these sediments in an appropriate treatment. | It is important to reduce or eliminate the direct exposures to contamination that currently exist at Terminal 4 by capping, dredging and disposal. Existing treatment technologies were determined not to be practical or effective for Terminal 4. It would be irresponsible for EPA to delay cleaning up Terminal 4 until a feasible treatment technology is developed. |
| 89 | 6 | No one has a crystal ball to see what the future lays before us. There might be catastrophic events; there might be small incidents of failures. But what is truly important is that we move forward with making our communities a better place whenever we can. Improve our way of doing business, our way of stewardship of our resources and lastly and no less important our way of embracing our local communities. We believe the Port of Portland is wanting to do the right thing in this cleanup and applaud their desire to step forward and try to address these contaminated sediments. | USEPA agrees that early action will help protect human health and the environment .Please see the response to <u>Comment 2-3</u> and <u>Comment 12-1</u> . |
| 89 | 7 | we do not feel that either capping or a CDF is in the best interest of the communities of North Portland. | Your concern is noted. It is important for EPA to evaluate the full range of options available for reducing risk to human health and the environment from uncontrolled contamination in sediment. |

APPENDIX C

ARARS

| ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility | | | |
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| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
| Federal ARARs | | | |
| Clean Water Act, Section 404 | 33 USC 1344 33 CFR Parts 320-323 40 CFR 230 | Regulates discharge of dredged and fill material into navigable waters of the United States. | Action-specific. Potentially applicable to dredging, covering, capping, and construction of in-water disposal facility and in-water filling activities in the Willamette River. |
| Clean Water Act, Ambient Water Quality Criteria | 33 USC 1313, 1314 40 CFR Part 131 | Provides minimum standards for water quality programs established by states. Two kinds of water quality criteria exist: one for protection of human health, and one for protection of aquatic life. | Chemical-specific and Action-specific. Potentially relevant and appropriate to activities that may result in a discharge or affect waters of the State of Oregon resulting from the implementation of the removal action and as performance standards for the confined disposal facility's containment of hazardous substances only if more stringent than promulgated state criteria. |
| Clean Water Act, Section 401 | 33 USC 1341 40 CFR Section 121.2(a)(3) and (4) | Any federally authorized activity which may result in any discharge into navigable waters requires reasonable assurance that the action will comply with applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of the Clean Water Act. | Action-specific. Potentially applicable to discharges into the river (i.e. during dredging and capping activities and discharges related to construction of the in-water disposal facility and during in-water activities) resulting from implementation of the removal action. |

| ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility | | | |
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| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
| Safe Drinking Water Act | 42 USC 3000f | Establishes national drinking water standards to protect human health from contaminants in drinking water | Chemical-specific Potentially relevant and appropriate to surface water designated as a potential drinking water supply for performance criteria for the confined disposal facility's containment of hazardous substances |
| Resource Conservation and Recovery Act | 40 CFR 260, 261 | Establishes identification standards and definitions for solid and hazardous waste, including when dredged material is exempt from the definition of a hazardous waste. | Action-specific. Potentially applicable to characterizing wastes generated from the action and designated for off-site disposal; potentially relevant and appropriate for use in identifying acceptance criteria for confined in-water disposal. |
| Fish and Wildlife Coordination Act Requirements | 16 USC 662, 663 40 CFR 6.302(g) | Requires federal agencies to consider effects on fish and wildlife from projects that may alter a body of water and mitigate or compensate for project-related losses. | Action-specific. Potentially applicable to determining appropriate mitigation for effects on fish and wildlife from performance of the removal action. |
| Magnuson-Stevens Fishery Conservation and Management Act | 50 CFR Part 600 | Evaluation of impacts to Essential Fish Habitat (EFH) is necessary for activities that may adversely affect EFH. | Location-specific. Potentially applicable if the removal action may adversely affect EFH. |

| ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility | | | |
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| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
| National Historic Preservation Act | 16 USC 470 <u>et seq.</u> 36 CFR Part 800 | Requires the identification of historic properties potentially affected by the agency undertaking, and assessment of the effects on the historic property and seek ways to avoid, minimize or mitigate such effects. Historic property is any district, site, building, structure, or object included in or eligible for the National Register of Historic Places, including artifacts, records, and material remains related to such a property. | Action-specific. Potentially applicable if historic properties are potentially affected by removal action. |
| Archeological and Historic Preservation Act | 16 USC 469a-1 | Provides for the preservation of historical and archeological data that may be irreparably lost as a result of a federally-approved project and mandates only preservation of the data | Action-specific. Potentially applicable if historical and archeological data may be irreparably lost by implementation of the removal action. |
| Native American Graves Protection and Reparation Act | 25 USC 3001-3013 43 CFR 10 | Requires Federal agencies and museums which have possession of or control over Native American cultural items (including human remains, associated and unassociated funerary items, sacred objects and objects of cultural patrimony) to compile an inventory of such items. Prescribes when such Federal agencies and museums must return Native American cultural items. "Museums" are defined as any institution or State or local government agency that receives Federal funds and has possession of, or control over, Native American cultural items. | Location-specific; action-specific. If Native American cultural items are present on property belonging to the Oregon Division of State Lands (DSL) that is a part of the removal action area, this requirement is potentially applicable. If Native American cultural items are collected by an entity which is either a federal agency or museum, then the requirements of the law are potentially applicable. |

ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility

| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
|---|---|---|---|
| Endangered Species Act | 16 USC 1531 et seq. | Actions authorized, funded, or carried out by federal agencies may not jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Agencies are to avoid jeopardy or take appropriate mitigation measures to avoid jeopardy. While there is currently no designated critical habitat for fish species in the removal action area, on December 14, 2004, NOAA Fisheries proposed to designate critical habitat for certain species of fish in the lower Willamette sub-basin. 68 Fed. Reg. 74572 (Dec. 14, 2004). | Action-specific. Potentially applicable due to potential impacts the removal action may have on endangered or threatened species or critical habitat that are present at the site or that may be affected by the action. |
| Executive Order for Wetlands Protection | Executive Order 11990 (1977) 40 CFR 6.302 (a) 40 CFR Part 6, App. A | Requires measures to avoid adversely impacting wetlands whenever possible, minimize wetland destruction, and preserve the value of wetlands. | Location-specific. Potentially relevant and appropriate in assessing impacts to wetlands, if any, from the removal action and for developing appropriate compensatory mitigation for the project. |

ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility

| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
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| Executive Order for Floodplain Management National Flood Insurance Act and Flood Disaster Protection Act | Exec. Order 11988 (1977) 40 CFR Part 6, App. A 40 CFR 6.302 (b) 42 USC 4001 <u>et seq.</u> 44 CFR National Flood Insurance Program Subpart A Requirements for Flood Plain Management Regulations Areas | Requires measures to reduce the risk of flood loss, minimize impact of floods, and restore and preserve the natural and beneficial values of floodplains. | Location-specific. Potentially relevant and appropriate for assessing impacts, if any, to the floodplain and flood storage from the removal action and developing compensatory mitigation that is beneficial to floodplain values. |
| Rivers and Harbors Act | 33 USC 403 33 CFR 320-330 | Section 10 prohibits the unauthorized obstruction or alteration of any navigable water. Structures or work in, above, or under navigable waters are regulated under Section 10. | Action-specific. Potentially applicable to capping and construction of the confined disposal facility. |
| Migratory Bird Treaty Act | 16 USC 703-702 50 CFR 10.12 | Makes it unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. "Take" is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping and collecting. | Action-specific Potentially relevant and appropriate to short-term impacts, if any, on migratory birds from removal activities. |
| State ARARs | | | |

| ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility | | | |
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| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
| Hazardous Waste Regulations | OAR 340-102-0011 | Federally authorized state of Oregon hazardous waste identification that operates in lieu of the base federal program. | Chemical-specific. Potentially applicable to characterizing wastes generated from the action, and determining appropriate off-site disposal options; potentially relevant and appropriate for use in identifying acceptance criteria for confined in-water disposal. |
| Oregon Hazardous Substance Remedial Action Law and Regulations | ORS 465.315; OAR 340-122-0040, 0045, 0070, 0115. | Establishes cleanup objectives and criteria applicable to hazardous substances. Includes requirements applicable to removal actions that are patterned after CERCLA; enforces criteria very similar to those required by the National Contingency Plan, only substantive provisions more stringent or broader in scope than CERCLA are ARARs. | Chemical-specific, action-specific. Potentially applicable to extent substantive criteria or requirements are more stringent or broader in scope than federal law. |
| State Removal Fill Law and Regulations | ORS 274.040, 0.43, .922, .944; OAR 141-85-0115, 0121, 0126, 0136, 0141, 0151 and 0171 | Regulates activities associated with removal and fill operations in state waters, including requirements for wetland mitigation. | Action-specific. Potentially relevant and appropriate to the dredging, capping and construction of the confined disposal facility. |

ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility

| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
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| Certification of Compliance with Water Quality Requirements and Standards | ORS 468b.035 | Provides that federally-approved activities that may result in a discharge to waters of the State requires evaluation whether an activity may proceed and meet water quality standards. Certifications may be approved with conditions, which if met, will ensure that water quality standards are met. | Chemical-specific. Potentially applicable to implementation of the removal action (e.g., dredging, capping, and construction of the confined disposal facility) that may result in a discharge to waters of the State. |
| State Water Quality Standards | ORS 468B.048; OAR ch 340 div 41 | Provides Willamette Basin beneficial uses and establishes water quality standards and criteria to protect beneficial uses. | Chemical-specific, action-specific. Potentially applicable to actions that may result in a discharge to or affect waters of the State; certain criteria may be potentially relevant and appropriate as performance standards and/or for long-term monitoring of surface water quality in the removal action area. |

ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility

| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
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| Indian Graves and Protected Objects | ORS 97.740-760 | Prohibits willful removal of cairn, burial, human remains, funerary object, sacred object or object of cultural patrimony. Provides for reinterment of human remains or funerary objects under the supervision of the appropriate Indian tribe. Proposed excavation by a professional archeologist of a native Indian cairn or burial requires written notification to the State Historic Preservation Officer and prior written consent of the appropriate Indian tribe. | Location-specific; action-specific. Potentially relevant and appropriate if archeological materials encountered. |
| Archeological Objects and Sites | ORS 358.905-955 | Prohibits persons from excavating, injuring, destroying or damaging archeological sites or objects on public or private lands unless authorized by permit. | Location-specific; action-specific. Potentially relevant and appropriate if archeological material encountered. |
| Requirements regarding Excavation or Removal of Archeological or Historical Material on Public Lands | ORS 390.235 OAR 736-051-0060 to 736-051-0090. | Requires permits and imposes conditions for excavation or removal of archeological or historical materials. | Location-specific; action-specific. Potentially relevant and appropriate if archeological material encountered. |

ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility

| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
|---|---|--|---|
| State Air Quality Law and Noise Control | ORS 468A OAR 340-226-0100, OAR 340-035-0035 | Provides general emission standards for fugitive emissions of air contaminants and requires the highest and best practicable treatment of control of such emissions. Prohibits any handling, transporting or storage of materials, or use of a road, or any equipment to be operated, without taking reasonable precautions to prevent particulate matter from becoming airborne. Sets noise standards for equipment, facilities, operations, or activities employed in the production, storage, handling, sale, purchase, exchange or maintenance of a product, commodity, or service, including the storage or disposal of waste products. | Action-specific. Potentially relevant and appropriate to certain activities during implementation of the removal action. |
| State Essential Indigenous Salmonid Habitat | ORS 196.810(b) OAR 141-102 | Designates Essential Salmonid Habitat and regulates activities affecting such habitat. | Location-specific. Potentially relevant and appropriate in assessing impacts to salmonid habitat and developing compensatory mitigation for the project. |
| Lower Willamette River Management Plan | ORS 273.045 OAR 141-080-0105 | Department of State Lands (DSL) plan regulating leasing, license, and permit activities in the lower Willamette River. The plan describes allowable activities and conditions for waterway management areas based on state public trust values (fisheries, recreation, and navigation). | Location-specific. Potentially relevant and appropriate to performance of the removal action performed on DSL land, including mitigation sites. |

| ARARs for Monitored Natural Attenuation, Capping, Dredging, and Confined Disposal Facility | | | |
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| Regulation | Citation | Criterion/Standard | Applicability/Appropriateness |
| ODFW Fish Management Plans for the Willamette River | OAR 635, div 500 | Provides basis for in-water work windows in the Willamette River. | Action-specific. Potentially applicable to implementation of the removal action due to presence of protected species at the site. |